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ANNUAL CALENDAR

OF

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UNIVERSITY,

MONTREAL.

FOUNDED UNDER BEQUEST OF THE HON. JAMES McGILL,
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SESSION 1902-1903

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C. J. FLEET, ESQ.
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DR. H. T. BOVEY.
DR. B. J. HARRINGTON.
DR. J. B. PORTER.

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SEPTEMBER, 1902.

1	Monday	Meeting of Faculty of Applied Science.
2	Tuesday	Normal School opens.
3	Wednesday	
4	Thursday	
5	Friday	
6	Saturday	Meeting of Faculty of Medicine.
7	SUNDAY	
8	Monday	
9	Tuesday	
10	Wednesday	Matriculation, Exhibition, Scholarship, Supplemental Examinations, Arts.
11	Thursday	Examinations continued. Finance Committee.
12	Friday	Examinations continued.
13	Saturday	
14	SUNDAY	
15	Monday	Introductory Lecture in Law. Examinations continued. Engineering Building Committee; Chemistry and Mining Building Committee. Register opens for students in Medicine.
16	Tuesday	Lectures in Law begin. Examinations in Arts continued. Supplemental Examinations, Applied Science.
17	Wednesday	Examinations continued.
18	Thursday	Examinations in Arts continued.
19	Friday	Meeting of Governors.
20	Saturday	Matriculation in Veterinary Science. Exhibition Examinations, Applied Science.
21	SUNDAY	
22	Monday	Meeting of Faculty of Arts. College Grounds Committee. Examinations in Summer Reading, Applied Science.
23	Tuesday	Introductory Lecture in Medicine. Lectures in Arts, Applied Science and Veterinary Medicine begin. Meeting of Examiners.
24	Wednesday	Lectures in Medicine begin.
25	Thursday	
26	Friday	
27	Saturday	
28	SUNDAY	
29	Monday	
30	Tuesday	

OCTOBER, 1902.

1	Wednesday	Normal School Committee. Meeting of Academic Board. Summer Essays in Applied Science to be sent in.
2	Thursday	Physics Building Committee.
3	Friday	Meeting of Faculty of Arts.
4	Saturday	Meeting of Faculty of Medicine.
5	SUNDAY	
6	Monday	Founder's Birthday. Meeting of Faculty of Applied Science. Museum Committee: Library Committee.
7	Tuesday	
8	Wednesday	Regular Meeting of Corporation. Annual Report to Visitor.
9	Thursday	Finance Committee.
10	Friday	The William Molson Hall opened, 1862. Sports Day.
11	Saturday	
12	SUNDAY	
13	Monday	
14	Tuesday	
15	Wednesday	
16	Thursday	
17	Friday	Meeting of Governors. Meeting of Faculty of Arts.
18	Saturday	
19	SUNDAY	
20	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
21	Tuesday	
22	Wednesday	
23	Thursday	
24	Friday	
25	Saturday	
26	SUNDAY	
27	Monday	
28	Tuesday	
29	Wednesday	
30	Thursday	
31	Friday	New Library opened, 1893. Meeting of Faculty of Arts.

NOTE.—Meetings of the Faculty of Arts are held at 5 P.M. unless otherwise specified.

NOVEMBER, 1902.

1	Saturday	Meeting of Faculty of Medicine.
2	SUNDAY	
3	Monday	Meeting of Faculty of Applied Science.
4	Tuesday	
5	Wednesday	
6	Thursday	
7	Friday	
8	Saturday	
9	SUNDAY	Edward VII born 1841.
10	Monday	
11	Tuesday	
12	Wednesday	
13	Thursday	Finance Committee.
14	Friday	Meeting of Faculty of Arts.
15	Saturday	
16	SUNDAY	
17	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
18	Tuesday	
19	Wednesday	
20	Thursday	
21	Friday	Meeting of Governors.
22	Saturday	
23	SUNDAY	
24	Monday	
25	Tuesday	
26	Wednesday	
27	Thursday	
28	Friday	Meeting of Faculty of Arts.
29	Saturday	
30	SUNDAY	

DECEMBER, 1902.

1	Monday	Meeting of Faculty of Applied Science.
2	Tuesday	
3	Wednesday	Meeting of Academic Board.
4	Thursday	Physics Building Committee.
5	Friday	
6	Saturday	Meeting of Faculty of Medicine.
7	SUNDAY	
8	Monday	Museum Committee: Library Committee.
9	Tuesday	
10	Wednesday	Regular Meeting of Corporation.
11	Thursday	Finance Committee.
12	Friday	Last day of Lectures in Arts for Term.
13	Saturday	
14	SUNDAY	
15	Monday	Christmas Examinations in Arts begin. Sessional Examinations in Medicine begin. Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
16	Tuesday	
17	Wednesday	
18	Thursday	
19	Friday	Meeting of Governors. Autumn term of Faculty of Medicine ends. Last day of Lectures in Law.
20	Saturday	
21	SUNDAY	
22	Monday	Christmas Vacation begins.
23	Tuesday	
24	Wednesday	
25	Thursday	Christmas-Day.
26	Friday	
27	Saturday	
28	SUNDAY	
29	Monday	
30	Tuesday	
31	Wednesday	

1 Thursday	
2 Friday	
3 Saturday	Meeting of Faculty of Medicine. Meeting of Faculty of Arts. (4 p.m.)
4 SUNDAY	
5 Monday	Lectures in Arts, Law and Applied Science resumed. Winter term Faculty of Medicine begins. Meeting of Faculty of Applied Science.
6 Tuesday	
7 Wednesday	Normal School Committee.
8 Thursday	Finance Committee.
9 Friday	Meeting of Faculty of Arts.
10 Saturday	
11 SUNDAY	
12 Monday	
13 Tuesday	
14 Wednesday	
15 Thursday	
16 Friday	Meeting of Governors.
17 Saturday	
18 SUNDAY	
19 Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
20 Tuesday	
21 Wednesday	
22 Thursday	Queen Victoria died, 1901.
23 Friday	Meeting of Faculty of Arts.
24 Saturday	
25 SUNDAY	
26 Monday	
27 Tuesday	
28 Wednesday	
29 Thursday	
30 Friday	
31 Saturday	Theses for M.A. and LL.D. to be sent in.

FEBRUARY, 1903.

1 SUNDAY	
2 Monday	Meeting of Faculty of Applied Science.
3 Tuesday	
4 Wednesday	Meeting of Academic Board.
5 Thursday	Physics Building Committee.
6 Friday	Meeting of Faculty of Arts.
7 Saturday	Meeting of Faculty of Medicine.
8 SUNDAY	
9 Monday	Museum Committee: Library Committee.
10 Tuesday	
11 Wednesday	Regular Meeting of Corporation.
12 Thursday	Finance Committee.
13 Friday	
14 Saturday	
15 SUNDAY	
16 Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
17 Tuesday	
18 Wednesday	
19 Thursday	
20 Friday	Meeting of Governors. Meeting of Faculty of Arts.
21 Saturday	
22 SUNDAY	
23 Monday	
24 Tuesday	Physics and Engineering Buildings opened Feb. 24th, 1893.
25 Wednesday	Ash Wednesday. No lectures.
26 Thursday	
27 Friday	
28 Saturday	

1	SUNDAY	
2	Monday	Meeting of Faculty of Applied Science.
3	Tuesday	
4	Wednesday	Meeting of Academic Board.
5	Thursday	
6	Friday	Meeting of Faculty of Arts.
7	Saturday	Meeting of Faculty of Medicine.
8	SUNDAY	
9	Monday	
10	Tuesday	
11	Wednesday	
12	Thursday	Finance Committee.
13	Friday	
14	Saturday	
15	SUNDAY	
16	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
17	Tuesday	
18	Wednesday	
19	Thursday	
20	Friday	Meeting of Governors. Meeting of Faculty of Arts. Reports of Attendance on Lectures. Winter term ends Faculty of Medicine.
21	Saturday	
22	SUNDAY	
23	Monday	
24	Tuesday	
25	Wednesday	
26	Thursday	
27	Friday	Convocation for Degrees in Veterinary Science. Last day of Lectures in Arts and Applied Science.
28	Saturday	
29	SUNDAY	
30	Monday	
31	Tuesday	

APRIL, 1903

1	Wednesday	Examinations in Arts begin. Normal School Committee.
2	Thursday	Physics Building Committee.
3	Friday	Last day of Lectures in Law.
4	Saturday	Meeting of Faculty of Medicine.
5	SUNDAY	
6	Monday	Museum Committee: Library Committee. Meeting of Faculty of Applied Science. Spring term begins, Faculty of Medicine.
7	Tuesday	
8	Wednesday	Regular Meeting of Corporation.
9	Thursday	Finance Committee.
10	Friday	Good Friday. Easter vacation begins.
11	Saturday	
12	SUNDAY	Easter Sunday.
13	Monday	
14	Tuesday	Easter vacation ends.
15	Wednesday	
16	Thursday	
17	Friday	Meeting of Governors.
18	Saturday	
19	SUNDAY	
20	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
21	Tuesday	
22	Wednesday	
23	Thursday	
24	Friday	
25	Saturday	
26	SUNDAY	
27	Monday	Graduate Course in Medicine begins.
28	Tuesday	
29	Wednesday	
30	Thursday	Convocation for Degrees in Arts, Law, and Applied Science

1	Friday	Summer Classes in Arts begin. Meeting of Examiners for School Examinations.
2	Saturday	Meeting of Faculty of Medicine.
3	SUNDAY	
4	Monday	Meeting of Faculty of Applied Science.
5	Tuesday	
6	Wednesday	
7	Thursday	
8	Friday	
9	Saturday	
10	SUNDAY	
11	Monday	
12	Tuesday	
13	Wednesday	
14	Thursday	Finance Committee.
15	Friday	Meeting of Governors.
16	Saturday	
17	SUNDAY	
18	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
19	Tuesday	
20	Wednesday	
21	Thursday	
22	Friday	
23	Saturday	Lectures end, Faculty of Medicine.
24	SUNDAY	
25	Monday	Examinations begin, Faculty of Medicine.
26	Tuesday	
27	Wednesday	
28	Thursday	
29	Friday	Normal School closes.
30	Saturday	
31	SUNDAY	Whit Sunday.

JUNE, 1903.

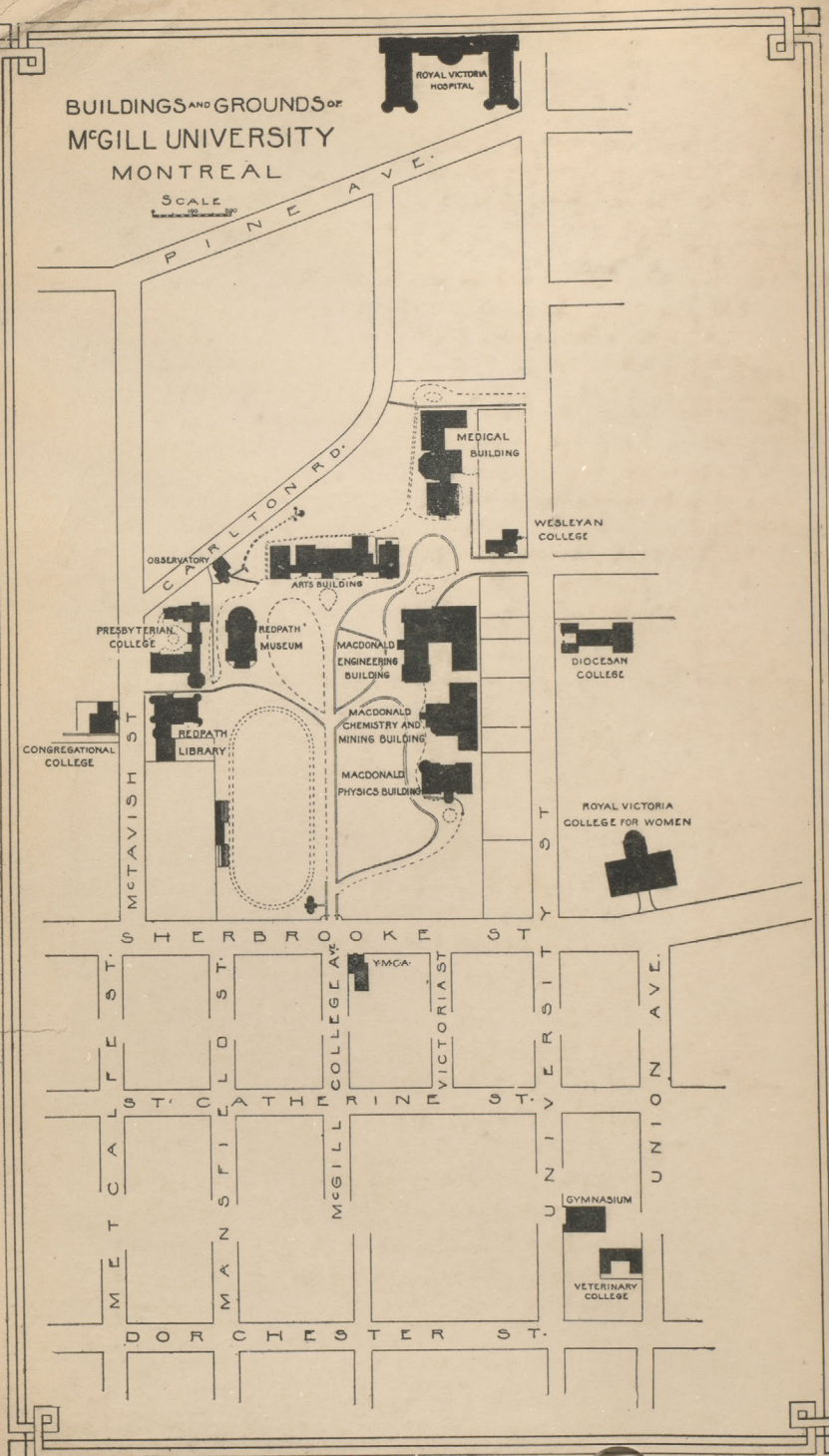
1	Monday	
2	Tuesday	
3	Wednesday	Normal School Committee.
4	Thursday	Physics Building Committee.
5	Friday	
6	Saturday	Graduate course in Medicine ends. Meeting of Faculty of Medicine.
7	SUNDAY	Trinity Sunday.
8	Monday	Examinations begin for Matriculation and Associate in Arts. Museum Committee: Library Committee.
9	Tuesday	
10	Wednesday	Regular Meeting of Corporation.
11	Thursday	Finance Committee.
12	Friday	Spring Term ends, Faculty of Medicine. Convocation for degrees in Medicine.
13	Saturday	
14	SUNDAY	
15	Monday	Engineering Building Committee: Chemistry and Mining Building Committee. College Grounds Committee.
16	Tuesday	
17	Wednesday	
18	Thursday	
19	Friday	Meeting of Governors.
20	Saturday	
21	SUNDAY	
22	Monday	
23	Tuesday	
24	Wednesday	
25	Thursday	
26	Friday	
27	Saturday	Summer Classes in Arts end.
28	SUNDAY	
29	Monday	
30	Tuesday	

JULY, 1903.

1 Wednesday	
2 Thursday	
3 Friday	
4 Saturday	Meeting of Faculty of Medicine.
5 SUNDAY	
6 Monday	
7 Tuesday	
8 Wednesday	
9 Thursday	
10 Friday	
11 Saturday	
12 SUNDAY	
13 Monday	
14 Tuesday	
15 Wednesday	
16 Thursday	
17 Friday	
18 Saturday	
19 SUNDAY	
20 Monday	
21 Tuesday	
22 Wednesday	
23 Thursday	
24 Friday	
25 Saturday	
26 SUNDAY	
27 Monday	
28 Tuesday	
29 Wednesday	
30 Thursday	
31 Friday	

AUGUST, 1903.

1 Saturday	
2 SUNDAY	
3 Monday	
4 Tuesday	
5 Wednesday	
6 Thursday	
7 Friday	
8 Saturday	
9 SUNDAY	
10 Monday	
11 Tuesday	
12 Wednesday	
13 Thursday	
14 Friday	
15 Saturday	
16 SUNDAY	Peter Redpath Museum opened 1882.
17 Monday	
18 Tuesday	
19 Wednesday	
20 Thursday	
21 Friday	
22 Saturday	
23 SUNDAY	
24 Monday	
25 Tuesday	
26 Wednesday	
27 Thursday	
28 Friday	
29 Saturday	
30 SUNDAY	
31 Monday	



Buildings and Grounds.—McGill University.

McGill University.

Foundation and Early History.

Almost alone in this respect among Canadian colleges and universities, McGill University owes its origin to a private endowment. Its founder, the Hon. James McGill, from whom the University takes its name, was born on the 6th October, 1744, in Glasgow, Scotland, where he received his early education and training. Emigrating to Canada before the American Revolution, he engaged in the North-West fur trade, then one of the leading branches of business in Canada. Subsequently he settled in Montreal, and, in partnership with his brother, Andrew McGill, became one of its leading merchants, distinguished for his public spirit and his exertions for the advancement of the city. He was lieutenant-colonel and subsequently colonel of the Montreal City Militia; and, in his old age, on the breaking out of the American war of 1812, he became brigadier-general, and was prepared to take the field in defence of his country. He also represented the West Ward of Montreal in the Provincial Legislature, and was afterwards a member of the Legislative and Executive Councils. Cultivating and enjoying the society of the few men of learning then in the colony, he took a special interest in the establishment of an educational system in the Province of Quebec. By his will, bearing date the 8th January, 1811, more than two years before his death, which happened on the 19th December, 1813, he bequeathed his property of Burnside and a sum of £10,000 in money, to found a college in a provincial university, the erection of which had already been provided for by the generosity of the British Government. Three leading citizens of Montreal were among the trustees appointed under his will, who were directed to convey the subject property of the bequest to the Royal Institution for the Advancement of Learning, a body which, in 1802, had been incorporated by the Legislature "for the establishment of Free Schools and the advancement of Learning" in the Province of Quebec. The conditions upon which the property was to be transferred to the Royal Institution for the Advancement of Learning were, mainly, that that Institution should, within ten years after the testator's decease,

erect and establish on his Burnside estate "an University or College, for the purposes of education and the advancement of learning in this Province," and that the college, or one of the colleges, in the University, if established, should "be named and perpetually be known and distinguished by the appellation of McGill College." Owing to persistent opposition by the leaders of one section of the people to any system of governmental education and to the refusal by the Legislature to make the grants of land and money which had been promised, the proposed establishment of the provincial university by the British Government was abandoned.

In so far as the McGill College was concerned, however, the Royal Institution at once took action by applying for a Royal Charter. Such a charter was granted in 1821, and the Royal Institution prepared to take possession of the estate. But, owing to protracted litigation, this was not surrendered to them till 1829. Commencing then the work of teaching with two faculties, Arts and Medicine, the record of the first thirty years of the University's existence is an unbroken tale of financial embarrassment and administrative difficulties. The charter was cumbrous and unwieldy, and unsuited to a small college in the circumstances of this country, and the University, with the exception of its medical faculty, became almost extinct. But after thirty years the citizens of Montreal awoke to the value of the institution which was struggling in its midst. Several gentlemen undertook the responsibility of its renovation, and, in 1852, an amended charter was secured. The Governor-General of Canada for the time being, Sir Edmund Head, became interested in its fortunes, and in 1855, with the advent of a new Principal, an era of progress and prosperity began.

Constitution of the University.

By the amended Charter "the Governors, Principal, and Fellows" of the University are constituted a body politic and corporate, with all the usual rights and privileges of corporate bodies. The supreme authority of the University, however, is vested in the Crown, and is exercised by His Excellency the Governor-General of Canada for the time being as Visitor. This is a special and important feature of the constitution, for, while it gives the University an imperial character and removes it at once from any merely local or party influence, it secures the patronage of the head of the political system of the country.

The **Governors** of the University are the members of the Royal Institution for the Advancement of Learning, above mentioned, and in them are vested the management of finances, the passing of University statutes and ordinances, the appointment of professors, and other important duties. Their number is limited to fifteen, and vacancies are filled by the nomination of the remaining members, with the approval of the Visitor. The President of the Board of Governors is, *ex-officio*, Chancellor of the University.

The **Principal** is the academic head and chief administrative officer. He is appointed by the Board of Governors, and is, *ex-officio*, Vice-Chancellor of the University.

The **Fellows** are limited to 43 in number, and are selected with reference to the representation of all the faculties and departments of the University, of affiliated colleges, and of other bodies.

The Governors, Principal, and Fellows, together constitute the **Corporation**, the highest academical body. Its powers are fixed by statute, and include the framing of all regulations touching courses of study, matriculation and graduation, and the granting of degrees.

The Principal, the Deans of the several Faculties, the Professors and Associate Professors, and other members, not exceeding ten in number, of the teaching staff, constitute the **Academic Board** of the University, with the duty of considering such matters as pertain to the interests of the University as a whole, and of making recommendations concerning the same.

The Statutes and Regulations of the University have been framed on the most liberal principles, with the view to affording to all classes of persons the greatest possible facilities for the attainment of mental culture and professional training.

Faculties and Courses.

The educational work of the University is carried on in McGill College, the Royal Victoria College for Women, and other University buildings in Montreal, and in affiliated colleges.

The Faculties are five in number :

The Faculty of Arts.—The undergraduate courses of study extend over four sessions of eight months each. In the third and fourth years extensive options are provided, and certain exemptions also are allowed to professional students. The courses of study lead to the Degrees of B.A., M.A., B.Sc., M.Sc., D.Sc., and D.Litt. The Degree of B.A. from this University admits the holder to the study of the learned professions, without preliminary examination, in the Provinces of Canada, and in Great Britain and Ireland, and elsewhere.

The undergraduate course in Arts can be taken along with the undergraduate course in Medicine or Applied Science in six years, or with the undergraduate course in Law in five years. This is effected by avoiding the duplication of courses in the same subjects or in those which give the same educational training, and by a proper adaptation of the time tables. Alternatively, a certificate of Literate in Arts is given along with the Degree in Medicine, Applied Science, or Law, to candidates who have completed two years in Arts before entering the professional Faculty.

The curriculum in Arts provides for the education of women, mainly in separate classes, with courses of study, exemptions, degrees, and honours identical with those for men.

The Faculty of Applied Science.—The undergraduate courses of study extend over four Sessions of eight months each, and provide a thorough professional training in Civil Engineering, Mechanical Engineering, Mining Engineering and Assaying, Electrical Engineering, Practical Chemistry, and Architecture. The courses of study lead to the Degrees of B.Sc., M.Sc., and D.Sc. The undergraduate course in Arts can be taken along with the undergraduate course in Applied Science in six years.

The Faculty of Law.—The undergraduate course extends over three Sessions of eight months each, and leads to the Degrees of B.C.L. and D.C.L. The undergraduate course in

Arts can be taken along with the undergraduate course in Law in five years.

The Faculty of Medicine.—The undergraduate course of study extends over four Sessions of nine months each, and leads to the Degree of M.D., C.M. The undergraduate course in Arts can be taken along with the undergraduate course in Medicine in six years.

The Faculty of Comparative Medicine and Veterinary Science.—The undergraduate course of study extends over three Sessions of six months each, and leads to the Degree of D.V.S.

Affiliated Colleges.

Students of Affiliated Colleges are matriculated in the University, and may pursue their course of study in the Affiliated College, or in part in the Affiliated College, and in part in McGill College, as the case may be, and may come up to the University Examinations on the same terms as the students of McGill College.

The Stanstead Wesleyan College, Stanstead, P.Q.—Is affiliated in so far as regards the work of the first two years in Arts. Detailed information may be obtained from the Rev. C. R. Flanders, B.A., D.D., Principal.

Vancouver College, Vancouver, B.C.—Is affiliated in so far as regards the work of the first two years in Arts. Detailed information may be obtained from J. C. Shaw, Esq., M.A., Principal.

Affiliated Theological Colleges.

Students of the following Affiliated Theological Colleges may attend the courses of study in Arts, either as undergraduates or partial students, with such facilities in regard to exemptions as may be agreed on.

The Congregational College of Canada, Montreal. Principal, Rev. E. M. Hill, D.D., 58 McTavish St.

The Presbyterian College, Montreal, in connection with the Presbyterian Church in Canada. Principal, Rev. D. H. MacVicar, D.D., LL.D., 69 McTavish St.

The Wesleyan College of Montreal. Principal, Rev. J. T. L. Maggs, B.A., B.D.

The Diocesan College of Montreal. Principal, Rev. Henry M. Hackett, M.A., B.D., 201 University St.

Calendars of the above Colleges and all necessary information may be obtained on application to their Principals.

McGill Normal School.

The McGill Normal School provides the training requisite for Teachers of Elementary and Model Schools and Academies. Teachers trained in this School are entitled to Provincial Diplomas, and may, on certain conditions, enter the classes in the Faculty of Arts for Academy Diplomas and for the Degree of B.A. Principal, S. P. Robins, LL.D., 32 Belmont St., Montreal, from whom copies of the School announcement may be obtained.

Affiliated High Schools, Etc.

The following schools are affiliated in the sense of preparing candidates for matriculation :

The Trafalgar Institute for the higher education of women, Simpson St., Montreal, Principal, Miss Grace Fairley. The High School of Montreal, and the Girls' High School of Montreal, Metcalfe St., Principal, Rev. Elson I. Rexford, B.A.

Schools which have prepared successful candidates for the University School Examinations or for matriculation (June, 1901) :

High School, Montreal ; Girls' High School, Montreal ; Abingdon School, Montreal; Miss Symmers' and Miss Smith's School, Montreal; Westmount Acad.; St. Andrew's School, Annapolis Royal, N.S.; Aylmer Academy; Bedford Academy; Bishop's Coll. School, Lennoxville; Coaticook Academy; Compton Ladies' Coll.; Cookshire Acad. ; Cowansville Academy ; Danville Acad. ; Dunham Ladies' Coll.; Gault Institute, Valleyfield; Granby High School; Huntingdon Acad.; Inverness Acad.; Knowlton Acad.; Lachute Acad. ; Lennoxville Academy ; Magog Mod. School ; Mansonville Mod. School ; New Westminster H. S. ; Orangeville High Sch. ; Ormstown Acad. ; Ottawa Coll. Inst. ; Paspebiac Model School; Boys, H. S., Quebec; Girls' H. S., Quebec; Ridley Coll., St. Catharines ; Shawville Academy ; School for Girls, St. John, N.B. ; Sherbrooke Acad.; Sherburne Acad.; Stanstead College School; Sutton Acad. ; St. Albans School, Berthier ; St. Bonaventure Coll., St. John's, Nfld.; St. Lambert Mod. School; St. Francis Coll. School ; High School, St. John, N.B. ; St. John's H. S. ; Upper Canada Coll. ; Vancouver Coll., Vancouver, B.C. ; High School, Victoria, B.C.; Waterloo Acad.; Waterville Model School; Williamstown H. S.

Affiliation to other Universities.

The University is affiliated to the Universities of Oxford, Cambridge, and Dublin, under conditions which allow an undergraduate who has taken two years work, and has passed the University Intermediate Examination in Arts, to pursue his studies and take his Degree at any of those universities on a reduced period of residence.

The Session.

The University Year or Session is divided into two terms, the first extending to the Christmas vacation, and the second from the expiry of the Christmas vacation to the date appointed for the meeting of Convocation for the conferring of degrees.

For 1902-1903 the Session of the **Faculty of Arts** commences on 10th September, 1902, and ends on 30th April, 1903. Lectures commence on 23rd September. Summer classes in English, Latin, Greek, Mathematics, French, German, and Logic will be held during the months of May and June.

The Session of the **Faculty of Applied Science** commences on 10th September, 1902, and ends on 30th April, 1903. Lectures commence on 23rd September. Field work in Surveying commences on 18th August, 1902. The Summer School in Mining commences at the end of the Session, and continues to about the end of the second week in June.

The Session of the **Faculty of Law** commences on 10th September, 1902, and ends on 30th April, 1903. Lectures commence on 15th September.

The Session of the **Faculty of Medicine** commences on 10th September, 1902, and ends on 13th June, 1903. The Introductory Lecture will be given on 23rd September.

The Session of the **Faculty of Comparative Medicine and Veterinary Science** commences on 20th September, 1902, and ends on 26th March, 1903. Lectures commence on 23rd September.

Board and Residence.

No residential accommodation has as yet been provided in the College for men students. Women students may board and reside either in private houses or in the Royal Victoria College, which provides, in addition to separate lecture rooms, residential accommodation for the women students of the University.

Good board and lodgings can be obtained in private houses in the vicinity of the University buildings at a cost of from $15 to $25 per month; or, separately, board at $12 to $15 per month, rooms at $4 to $10 per month.

A list of suitable boarding and Lodging houses, the sanitary conditions of which are required to be properly certified, is prepared annually, and may be obtained upon application to the Registrar of the University or the Janitor of the Medical Building.

Full particulars of the Royal Victoria College for Women and the terms of residence therein are given on pp. 153-157.

The erection of suitable University residential halls for men is contemplated in the near future.

The McGill Y.M.C.A. will arrange to meet any stranger at the station, and aid him to secure lodgings, etc., if sufficient notice of time of arrival and station is sent to the secretary of the McGill Y.M.C.A., 844 Sherbrooke Street, Montreal.

Exhibitions, Scholarships, Prizes, Etc.

Bursaries, Exhibitions, and Scholarships, particulars of which are given in the announcements of the several Faculties (see *post*), are offered for competition to students entering the University. In addition to a number of valuable exhibitions and scholarships offered for competition to Second and Third Year students, First Year Entrance Exhibitions, ranging from $90 to $200 each, will be offered for competition to students entering the First Year in Arts in September, 1902. For

details of the examination, which may serve also as an examination for matriculation, see pp. 47 *et seqq.*

Gold Medals, Honours, and Prizes are awarded for advanced courses of study.

Classification of Students.

Except under special circumstances, no student under the age of sixteen is admitted to the First Year courses, or under the age of seventeen to the Second Year courses in Arts, Applied Science, or Medicine, and no student under the age of seventeen is admitted to the courses in Law or Comparative Medicine and Veterinary Science.

Students are classified as Graduate Students (see p. 26), Undergraduates, Conditioned Students, and Partial Students.

Undergraduates are matriculated students who are pursuing a full undergraduate course of study leading to a degree.

Conditioned Students are those who, not having completed their matriculation examination, are pursuing a full undergraduate course of study leading to a degree, and are entitled, under the regulations of the Faculty, to obtain undergraduate standing upon completing their matriculation ; credit being given for their work as Conditioned Students (see p. 10).

Partial Students are those who, not belonging to one of the above classes of students, are pursuing a course of study in the University.

Women are admitted to the courses in Arts (on identical terms with men, but mainly in separate classes), and also to the Architectural, Freehand Drawing, and Modelling Classes in Applied Science.

All students are required to attend lectures at the University buildings in Montreal, or at one of the affiliated colleges.

Undergraduates.

In order to obtain undergraduate standing, a candidate must have passed the Matriculation Examination of the University, or some other examination accepted in lieu thereof (see p. 11), and have registered as a Matriculated Undergraduate.

Conditioned Students

Candidates who in the September Matriculation Examination fail in a small part only of the whole examination may, if so recommended by the Board of Matriculation Examiners, enter the First Year Undergraduate Course as Conditioned Students. Such students can obtain full undergraduate standing, by passing at a subsequent June or September Matriculation in the subjects in which they failed, and will not be permitted to enter the second year of their course of study until such examinations have been passed.

Partial Students.

Partial Students may, subject to the approval of the Professor, attend any class without previous examination.

Partial Students who subsequently obtain undergraduate standing by passing the Matriculation Examination may, as Undergraduates, be exempted, at the discretion of the Faculty, from a particular course or courses of lectures which they have attended as Partial Students.

Matriculation.

All inquiries relating to the Matriculation Examination should be addressed to the Secretary of the Board of Matriculation Examiners.

I. Matriculation Examination Regulations.

1. Matriculation Examinations (for entrance in all Faculties except the Faculty of Comparative Medicine and Veterinary Science) are held only in June and September. The examinations are held in June at McGill College and at local centres ; in September at McGill College and affiliated colleges (Vancouver, B.C., and Stanstead, P.Q.) only.

2. All candidates for examination are required to fill up an application form and return the same with the necessary

fee one month before the examination. Blank forms may be obtained on application to the Secretary of the Board of Matriculation Examiners, to whom all inquiries relating to the examination should be addressed.

3. In order to obtain an examination at a local centre, any Head Master or other person must, before May 1st, submit to the Secretary of the Board of Matriculation Examiners the name of some suitable person, preferably a University Graduate, who is willing to act as Deputy Examiner, *i.e.*, receive the questions, hold the examinations, and forward the answers to Montreal. The University will not be responsible for local expenses.

4. Candidates may take Arithmetic, and all the English subjects except Literature, at any Matriculation Examination, and the remaining subjects at any subsequent Matriculation Examination.

5. Candidates who fail in one or more subjects at the June Examination, or who have taken part only of the examination, and present themselves again in the *following* September, will not be required to take the subjects in which they passed in June.

6. Candidates who in the September Examinations fail in a small part only of the whole examination, may, if so recommended by the Board of Matriculation Examiners, enter the First Year Undergraduate Course as Conditioned Students. Such students can obtain full undergraduate standing by passing at a subsequent June or September Matriculation Examination in the subjects in which they failed, and will not be permitted to enter the Second Year of their Course of Study until such examinations have been passed.

7. Certificates of having passed the following examinations are accepted *pro tanto* in lieu of the Matriculation Examination, *i.e.*, in so far as the subjects and standard are, to the satisfaction of the Board of Matriculation Examiners, the same as or equivalent to those required for the Matricula-

tion Examination of the University; but candidates offering certificates of having passed such examinations will be required to pass the Matriculation Examination in such of the required subjects, if any, as are not covered by their certificates :—

Province of Quebec.

The Preliminary subjects of the A.A. Examination and Academy Grade II.

The University School (A.A.) Examinations.

The McGill Normal School Model School Diploma, under certain conditions.

Province of Ontario.

The Leaving Examinations, Parts I. and II.

Province of Nova Scotia.

The Leaving Examinations, Grades XI. and XII.

Province of Prince Edward Island.

The Leaving Examination of Prince of Wales College.

Province of British Columbia.

The Intermediate Grade and Senior Grade Examinations.

Applications for exemptions from the Matriculation Examination, based upon certificates of having passed examinations other than those above mentioned, will be considered as occasion may require by the Board of Matriculation Examiners. Every such application must be accompanied by certificates and full particulars, and should be addressed to the Secretary of the Board.

II. Matriculation Fees.

For the Matriculation Examination	$5 00
(In case of a Local Examination, where one candidate only is examined, the fee will be $10.00.)	
In case of candidates who do not complete the examination at one time, for the first examination . .	5 00
For any subsequent examination	2 00
For examination of certificates, other than A.A. Certificates, in respect of which candidates are exempted from the whole of the Matriculation Examination	1 00

Candidates who have passed the University School (A.A.) Examination in the required matriculation subjects, and desire to enter the University, are required to pay the same fee as that for the Matriculation Examination, viz., $5.00, less any sum already paid in connection with the A.A. Examination.

Candidates for First Year (Arts) Exhibitions who have paid the matriculation fee as above provided, may compete in the Exhibition Examinations without further fee. Other candidates for the Exhibitions will pay the same fee as that for the Matriculation Examination, viz., $5.00 ; the First Year Exhibition Examination being in that case regarded as a Matriculation Examination.

Certificates will, on application, be issued to successful candidates without additional fee. Duplicate certificates will not be granted unless satisfactory proof be given of the loss or destruction of the original. The fee for a duplicate certificate is $1.00.

III. Subjects of Examination.

Faculty of Arts.

For candidates intending to take the B.A. course :—

1. **English** and **History.**
2. **Mathematics, Part I.**
3. **Latin** *or* **Greek.**
4. **Greek** *or* **Latin,** (If not already chosen.)
   or **two Modern Languages,**
   or **one Modern Language** with **Mathematics, Part II.**
5. One of the following :
   Physiography, Botany, Chemistry, Physics, a **Language** not already chosen.

For candidates intending to take the B.Sc. course in Arts (see p. 68) :

1. **English** and **History.**
2. **Mathematics, Part I.**
3. **French.**
4. **German.**
5. One of the following :
   Physiography, Botany, Chemistry, Physics, Latin, Greek Mathematics, Part II.

Candidates who intend ultimately to proceed to the study of Medicine are reminded that for Medical Registration it will be necessary to take Latin.

Faculty of Applied Science.

1. **English** and **History.**
2. **Mathematics, Part I.**
3. **Mathematics, Part II.**
4. **French** *or* **German** *or* **Latin** *or* **Greek.**
5. One of the following :
   Physiography, Botany, Chemistry, Physics, a **Language** not already chosen.

In addition to those who qualify on certificates mentioned on p. 11, par. 7, students who have completed one or more years of the Arts Course may enter this Faculty on passing an examination in the additional mathematics, if any, required for Matriculation in the Faculty of Applied Science.

Faculty of Law.

Bachelors of Arts, Science, or Letters of any Canadian or British University (see R.S.Q., 3503*a*) are admitted without examination.

Candidates who intend to practise law or to be admitted to the notarial profession in the Province of Quebec are referred to the statutory requirements (see p. 256 *infra*). If they are not graduates they should pass the examination for admission to study required by the Council of the Bar or by the Board of Notaries, as the case may be, before seeking to matriculate. In that case they will be matriculated without examination. For other candidates the subjects required for matriculation are as follows :—

1. **English** and **History,**
2. **Mathematics, Part I.**
3. **Latin.**
4. **French.**
5. One of the following :
   Physiography, Botany, Chemistry, Physics, Greek, German.

Candidates must reach a high standard in Latin and French.

Faculty of Medicine.

In 1902 :—

1. **English** and **History.**
2. **Mathematics, Part I.**
3. **Latin.**
4. One of the following:
   French, German, Greek, Chemistry, Physics.

In 1903 and subsequently :—

1. **English** and **History.**
2. **Mathematics, Part I.**
3. **Latin.**
4. **Chemistry.**
5. **Physics.**
6. One of the following:
   Greek, French, German.

In addition to the certificates mentioned on p. 11, par. 7, the following are accepted in lieu of the Matriculation Examination for entrance in Medicine :—

The Degree of Bachelor of Arts obtained from any recognized university.

A certificate of having passed the Examination of a Provincial Medical Council.

In the case of candidates from the United States, a certificate of having passed a State or University Examination fully equivalent to the Matriculation Examination required for entrance in this University.

All certificates must cover Latin.

The examination requirements for those who intend to practise medicine in any of the Provinces of Canada, or in Great Britain and Ireland and the British Colonies will be found on pp. 268 *et seqq.*

Faculty of Comparative Medicine and Veterinary Science.

The Matriculation Examination for the Faculty of Comparative Medicine and Veterinary Science is held separately. Details of this examination will be found on p. 330.

IV.—Details of the Subjects.

English and History.

Dictation.

Grammar.—A paper on English Grammar, including Analysis. The candidate will be expected to show a good knowledge of Accidence, as treated in any grammar prepared for the higher forms of schools. A similar statement applies to grammatical Analysis. Candidates are required to state the class to which any subordinate sentence belongs, and to arrange and define the various members of all sentences set. Failure in Analysis and Parsing will cause the rejection of the paper. West's English Grammar for Beginners is recommended as a text-book.

British History.—Candidates will be required to give the chief details of leading events. While any text-book written for the upper forms of schools may be used in preparation for the examination, Gardiner's Outline of English History (Longmans) is recommended.

Composition.—Candidates will write a short essay on a subject given at the time of the examination.

Literature.—1902—(*a*) Scott's Lady of the Lake (ed. Stuart, Macmillan), or selections from Tennyson, Part I. (ed. Rowe and Webb, Macmillan); (*b*) Shakspere's Richard II. (ed. Deighton, Macmillan.)

1903. As in 1902.

1904. Selections from Tennyson, Part I. (ed. Rowe & Webb, Macmillan); Shakspere's Merchant of Venice.

The requirements for the Junior Leaving English of the Province of Ontario will be accepted.

Mathematics, Part I.

Arithmetic.—Elementary Rules, Vulgar and Decimal Fractions, Proportion, Percentage, Simple Interest, etc., Square Root, and a knowledge of the Metric System.

Geometry.—Euclid's Elements, Books I, II, III, with easy deductions; or an equivalent.

Algebra.—Elementary Rules, Involution, Evolution, Fractions, Indices, Surds, Simple and Quadratic Equations of one or more unknown quantities, as in Hall and Knight's Elementary Algebra to end of Surds (omitting portions marked with an asterisk), or in similar text-books.

Mathematics, Part II.

Geometry.—Euclid's Elements, Books IV. and VI., with definitions of Book V., and easy deductions ; or an equivalent.

Algebra.—The three Progressions, Ratio, Proportion, Variation, Permutations and Combinations, Binomial Theorem, Logarithms, Interest and Annuities, as in remainder of Hall and Knight's Elementary Algebra, (omitting chaps. 36, 40, 41, 42) or in similar text-books.

Trigonometry.—Measurement of angles, Trigonometrical ratios or functions of one angle, of two angles and of a multiple angle, as in Hamblin Smith, pp. 1-105, or as in Lock's Elementary Trigonometry, Chap. I-XII., or in similar text-books.

Greek.

Grammar.

Texts.—(Translation and grammatical study) :—

1902—Xenophon, Anabasis I. or II.

1903—Xenophon, Anabasis I. (as in White's Beginners' Greek Book, pp. 304-428), or Xenophon, Anabasis II.

1904—As in 1903.

Translation at Sight, and Prose Composition (sentences or easy narrative based upon the prescribed texts).

The requirements for the Junior Leaving Greek of the Province of Ontario will be accepted in place of the texts specified above. At the September Examination other texts equivalent to those specified may be accepted if application be made to the Secretary of the Board of Matriculation examiners, at least one month before the date of the examination.

Latin.

Grammar.

Texts.—(Translation and grammatical study) :—

1902—Caesar, De Bellico Gallico IV. and V.
Virgil, Aeneid II.

1903—Cornelius Nepos, Lives of Miltiades and Epaminondas (G. H. Nall in Macmillan's Elementary Classics).
Caesar, De Bello Gallico, I. and II.
Ovid, Stories from the Metamorphoses (as in Gleason's "A Term of Ovid," pages 1 to 53, American Book Company).

1904—As in 1903.

Translation at Sight, and Prose Composition (sentences and easy narrative based upon the prescribed texts).

The requirements for the Junior Leaving Latin of the Province of Ontario will be accepted in place of the texts specified above. At the September Examination other texts in Latin equivalent to those specified may be accepted, if application be made to the Secretary of the Board of Matriculation Examiners at least a month before the day of the examination.

French.

Grammar.—Accidence and Syntax. Candidates will be required to possess an exact knowledge of the common elements. Bertenshaw's French Grammar is recommended as containing the amount required for the examination.

Translation at Sight from French into English. Translation into French of easy English passages. Brief reproduction in French of a story read by the examiner in English.

German.

Grammar.—A thorough knowledge of German accidence.

Translation.—Candidates must be able to translate into German with tolerable correctness exercises approximately equal in difficulty to those contained in the First Part of Van der Smissen's High School German Grammar, or in the First and Second Parts of the Joynes-Meissner German Grammar (Heath & Co.).

Texts.—(Translation and grammatical study) :—
1902—Leander, Träumereien (Copp, Clark Co.)
1903—As in 1902.
1904—Auf der Sonnenseite (Heath & Co.)
Storm, Immensee "

The requirements for the Junior Leaving German of the Province of Ontario will be accepted in place of the texts specified above. At the September examination other texts equivalent to those specified may be accepted, if application be made to the Secretary of the Board of Matriculation Examiners, at least one month before the date of examination.

Physiography.

The elements of the Science, as in Tarr's First Book of Physical Geography, or Hinman's Eclectic Physical Geography, or other text-books covering the same ground.

Botany.

As in Groom's Elementary Botany.

Candidates will be given extra credit for Plant collections of a maximum of 25 species each. They will use Penhallow's Guide to the Collection of Plants and Blanks for Plant Descriptions.

The collections will be returned, if desired, at the expense of the school or individuals to whom they belong.

Any plant of the same family may be substituted for any one of those specified in Part II. of Groom's Elementary Botany, according to the requirements of the locality.

Chemistry.

Elementary Inorganic Chemistry, comprising the preparation and properties of the chief non-metallic elements and their more important compounds, the laws of chemical action, combining weight, etc. (The ground is simply and effectively covered by Remsen's "Elements of Chemistry" (Macmillan), pp. 1 to 165.

Physics.

Properties of Matter ; Elementary Mechanics of Solids and Fluids, including the Laws of Motion, Simple Machines, Work, Energy ; Fluid Pressure and Specific Gravity ; Thermometry, The effects and modes of transmission of Heat. (See, for instance, Gage's Introduction to Physical Science, ch. I-V.)

V.—Dates of the Examinations.

2. The examinations in 1902 will commence on June 9th and on September 10th. Special arrangements may be made for the examination of candidates who are prevented by severe illness or domestic affliction from presenting themselves on these dates.

The time-table for the June Examination will be as follows:

Mon.	9th,	9	a.m.—English Grammar.
		10.30	a.m.—English Dictation and Composition.
		2	p.m.—Mathematics, Part I. (Algebra).
		3.30	p.m.—French.
Tues.	10th,	9	a.m.—Mathematics, Part I. (Arithmetic).
		10.30	a.m.—History.
		2	p.m.—Mathematics, Part I. (Geometry).
		4	p.m.—Mathematics, Part II. (Trigonometry).
Wed.	11th,	9	a.m.—Latin.
		2	p.m.—Chemistry.
		3.30	p.m.—Physics.
Thur.	12th,	9	a.m.—Mathematics, Part II. (Algebra and Geometry).
		11	a.m.—English Literature.
		2	p.m.—German.
		4	p.m.—Physiography.
Fri.	13th,	9	a.m.—Greek.
		2	p.m.—Botany.

The time-table for the September Examination will be as follows :—

Wed.	10th,	9	a.m.—Latin Books and Sight Translation.
		2	p.m.—Latin Grammar and Composition.
Thur.	11th,	9	a.m.—Mathematics, Part I. (Geometry).
		2	p.m.—Mathematics, Part I. (Arithmetic and Algebra).
Fri.	12th,	9	a.m.—English Grammar and History.
		2	p.m.—English Literature, Dictation, Composition.
Mon.	15th,	9	a.m.—French.
		2	p.m.—German.
Tues.	16th,	9	a.m.—Mathematics, Part II.
		2	p.m.—Physiography, Botany, Chemistry, Physics.
Wed.	17th,	9	a.m.—Greek Books and Sight Translation.
		2	p.m.—Greek Grammar and Composition.

Admission to Second Year.

Admission to the Second Year is open, as a rule, only to Undergraduates who have passed the First Year Sessional Examination in regular course, but in exceptional cases, to be dealt with by the Faculty in which they desire to register, candidates may be admitted directly to the Second Year without having passed through the curriculum of the First Year.

Students of Other Universities Applying For Equivalent Standing.

Any student of another University desirous to be admitted to this University with equivalent standing is requested to send with his application:—

1st.—A Calendar of the University in which he has studied, giving a full statement of the courses of study.

2nd.—A complete statement of the course he has followed.

3rd.—A certificate of the standing gained, and of conduct.

These will be submitted to the Faculty in which he desires to register.

The Faculty, if otherwise satisfied, will decide what examination, if any, or what conditions, may be necessary before admitting the candidate.

Registration.

1. Candidates for entrance (Undergraduates, Conditioned Students and Partial Students), are required to attend at the office of the Registrar of the University for the purpose of giving their addresses and other particulars, and of signing the following declaration in the Matricula or Register:

"I hereby declare that I will faithfully observe the Statutes, rules, and ordinances of this University of McGill College to the best of my ability."

2. Every Undergraduate or Conditioned Student must produce to the Registrar of the University* his Matriculation Certificate or other certificate accepted as qualifying the candidate for entrance. The candidate is then entitled to enter as an undergraduate or conditioned student, as the case may be, in the Faculty in which he desires to register.

3. After registration and payment of the required fees, the student will be given tickets of admission to the classes which he is entitled to attend. The tickets of admission must be shown at the commencement of the session to the Dean of the Faculty† in which the student is registered, and also to the Professor or Lecturer in charge of any class attended by him.

4. After the lapse of a fortnight from the commencement of lectures, Professors and Lecturers in charge of classes will require every attending student to produce his ticket of admission, and will report to the Dean† the name of any student failing to produce it; and if, thereafter, upon notice by the Dean to the Professor or Lecturer, the student is not able to produce his ticket of admission, the Professor or Lecturer will prohibit him from further attendance, and will report to the Dean† accordingly; and similarly in the case of students joining the class during the course of the session.

* In the case of students in Medicine, to the Registrar of the Faculty of Medicine. In the case of students in Comparative Medicine, to the Registrar of the Faculty of Comparative Medicine and Veterinary Science.

† In the case of the Faculty of Medicine to the Registrar of that Faculty.

Degrees.

All theses for higher degrees must be sent to the Registrar of the University. No thesis will be received or examination granted until the fee for the degree has been paid.

In order to obtain the degrees of B.A., B.Sc., B.C.L., M.D., C.M., and D.V.S., students of this University are required to attend the lectures and to pass the examinations of the undergraduate courses.

Regulations for the Degree of B.A.

Students who shall have satisfactorily completed the Regular Course of Study in Arts, shall have passed the prescribed examinations during the Course, and also the special examinations for graduation, and shall have performed such exercises as may be prescribed to that end, shall be entitled to the Degree of Bachelor of Arts.

Regulations for the Degree of B.Sc.

Students who shall have satisfactorily completed the prescribed Course of Study in the Faculty of Arts for the Degree of Bachelor of Science, or the Course of Study in the Faculty of Applied Science, shall have passed the prescribed examinations during the Course, and also the special examinations for Graduation, and shall have performed such exercises as may be prescribed to that end, shall be entitled to the Degree of Bachelor of Science.

Regulations for the Degree of B.C.L.

Students who shall have satisfactorily completed the Regular Course of Study in Law, shall have passed the prescribed examinations during the Course and also the special examinations for Graduation, shall be entitled to the Degree of Bachelor of Civil Law. A Bachelor or Master of Arts, or an Articled Student with a practising Member of the Bar of the Province of Quebec, who shall have matriculated in the third

year of his Clerkship under such articles, shall be entitled to such Degree after two years' attendance on the said Course of Study, if he shall satisfactorily pass all requisite examinations, and perform all required exercises.

Regulations for the Degree of M.A.

Bachelors of Arts of at least one year's standing who (*a*) shall have taken for one year a graduate course of study in Arts in the University, previously submitted to and approved by the Faculty, and (*b*) shall have passed an examination at the end of the course, and (*c*) shall have presented, if required, a satisfactory thesis, shall be entitled to the Degree of Master of Arts. Bachelors of Arts of at least two years' standing who shall have presented a satisfactory thesis and passed a special examination, shall be entitled to the Degree of Master of Arts.

Any Bachelor of Arts who graduated prior to May 1st, 1899, or any Undergraduate in Arts registered at that date, and proceeding thereafter to the Degree of Bachelor of Arts, shall at his option be entitled to the Degree of Master of Arts on the following conditions :

1. A candidate must be a Bachelor of Arts of at least three years' standing.

2. He is required to prepare and submit to the Faculty a thesis on some literary or scientific subject, under the following rules :—

(*a*) The subject of the thesis must be submitted to the Faculty before the thesis is presented.

(*b*) A paper read previously to any association, or published in any way, cannot be accepted as a thesis.

(*c*) The thesis submitted becomes the property of the University, and cannot be published without the consent of the Faculty of Arts.

(*d*) The thesis must be submitted before some date to be fixed annually by the Faculty, which date must not be less than two months before the candidate proceeds to the Degree.

The last day in the session of 1902-1903 *for sending in Theses for M.A. will be Jan.* 31*st,* 1903.

3. All candidates, except those who have taken First or Second Rank B.A. Honours, or have passed First Class in the Ordinary Examinations for the Degree of B.A., are required to pass an examination also, either in Literature or in Science, as each candidate may select.

(*a*) The subjects of the Examination in *Literature* are divided into three divisions as follows :—

Group A.—Latin, Greek, Hebrew.

Group B.—French, German, English.

Group C.—History, Economics and Political Science, Law.

(*b*) The subjects of the Examination in *Science* are divided into three divisions:—

Group A.—Pure Mathematics (advanced or ordinary), Mechanics (including Hydrostatics), Astronomy, Optics.

Group B.—Geology and Mineralogy, Botany, Zoology, Chemistry.

Group C.—Mental Philosophy, Moral Philosophy, Logic, History of Philosophy.

(*c*) Every candidate is required to select two out of the three groups in the section in which he is a candidate ; and in one of the groups so chosen to select for Examination two subjects, and in the other group one subject.

(*d*) One of the subjects selected as above will be considered the principal subject (being so denoted by the candidate at the time of application), and the other two as subordinate subjects.

(*e*) The whole examination may be taken in one year, or distributed over two or three years, provided the examination in any one subject be not divided.

For further details of the examination, application must be made to the Faculty before the above date.

The fee for the degree is $20; *in absentia*, $40. (In case of failure, the candidate may present himself in a subsequent

year without further payment of fees.) The examination will be held in April in McGill College only. A candidate after fulfilling all the conditions ought to notify the Faculty of his desire to proceed to the degree at the next convocation.

Candidates who obtained the degree of B.A. before 1884 *may proceed to the degree of M.A. under the regulations in force previous to* 1884.

Lectures are open to Bachelors of Arts who are candidates for M.A., the sessional examinations corresponding to these lectures being reckoned as parts of the M.A. examination. The subjects are Greek, Latin, English, French, German, History, Mental and Moral Philosophy, Chemistry, Experimental Physics, Botany, Zoology, Geology and Mineralogy. Certificates of standing will be given.

Regulations for the Degree of M.Sc.

Bachelors of Arts or Bachelors of Science of at least one year's standing who shall have taken for one year a Graduate Course of Study in the Faculty of Arts or the Faculty of Applied Science of the University, previously submitted to and approved by the Faculty, shall have passed an examination at the end of the year, and shall, if required, have presented a satisfactory thesis; or Bachelors of Arts or Bachelors of Science of at least two years' standing who shall have presented a satisfactory thesis, and shall have passed a special examination for the degree, shall be entitled to the Degree of Master of Science.

The fee for the degree is $20; *in absentia*, $40.

Regulations for the Degree of M.D.

Students who shall have satisfactorily completed the Regular Course of Study in Medicine, shall have passed the prescribed examinations during the course, and also the special examinations for Graduation, shall be entitled to the Degree of Doctor of Medicine and Master of Surgery.

Regulations for the Degree of D.V.S.

Students who shall have satisfactorily completed the Regular Course of Study in Comparative Medicine and Veterinary Science, shall have passed the prescribed examinations during the course, and also the special examinations for Graduation, shall be entitled to the Degree of Doctor of Veterinary Surgery.

Regulations for the Degree of D.Litt.

Candidates for the Degree of Doctor of Literature must be Masters of Arts, who, being graduates at least of five years' standing, shall have distinguished themselves by special research and learning in the domain of Literature or Philosophy. They are required to present a satisfactory thesis or published work.

The fee for the degree is $80.

Regulations for the Degree of D.Sc.

Candidates for the Degree of Doctor of Science must be Masters of Arts or Masters of Science, or Doctors of Medicine, who, being graduates of at least five years' standing, shall have distinguished themselves by special research and learning in the domain of Science. They are required to present a satisfactory thesis or published work.

The fee for the degree is $80.

Regulations for the Degree of D.C.L.

Candidates for the Degree of Doctor of Civil Law must be Bachelors of Civil Law of at least twelve years' standing. They are required to pass a special examination for the degree and to present a satisfactory thesis or published work on some subject selected or approved by the Faculty of Law. For details of the examination, etc., see pp 254-256.

The fee for the degree is $80.

Regulations for the Degree of LL.D.

Except as hereinafter mentioned, the Degree of Doctor of Laws is given only as an honorary degree.

Any person who matriculated and attended lectures in the Faculty of Arts before the 31st January, 1899, may proceed to the Degree of Doctor of Laws in course upon the following conditions:

Candidates for the Degree of LL.D. in course must be Masters of Arts of at least twelve years' standing, and are required to prepare and submit to the Faculty of Arts, not less than three months before proceeding to the degree, twenty-five printed copies of a thesis on some Literary or Scientific subject which has been *previously approved by the Faculty.* The thesis must exhibit such a degree of literary or scientific merit, and give evidence of such originality of thought or extent of research as shall, in the opinion of the Faculty, justify recommendation for the degree.

Candidates are also required to submit, with their thesis, a list of books treating of some one branch of Literature or of Science satisfactory to the Faculty in which they are prepared to submit to examination, and in which they shall be examined, unless otherwise ordered by the Faculty.

The fee for the degree in course is $80.

Admission "Ad Eundem Gradum."

The following are the regulations applicable to admission "ad eundem gradum" :—

Extract from the Statutes, Chap. VIII.

"Graduates of other Universities, desirous of admission "to the like Degree in this University, may be so admitted "by the Corporation ; due enquiry being first made as to "their moral character and sound learning, and opportunity "given to the several Faculties to make such representation "in the premises as they may see fit. Provided always, that, "unless by unanimous consent, such admission shall not "be put to vote until after three months' notice, and shall "not be ordered, if as many as five Members of the Cor-"poration shall vote against it."

Extract from the Regulations of the Corporation.

"In all cases in which anyone is proposed for any 'Ad "Eundem' degree, it shall be necessary for the Member or "Members of the Corporation making such proposal, to state "in writing therewith the grounds upon which the granting "of such degree is advocated, and when the case shall be re- "ferred to the Faculties, under Chap. VIII. of the Statutes, "copies of such proposal and grounds shall be transmitted to "the Faculties by the Secretary for their consideration."

Note.—In considering applications under the above regulations, the Faculties will require as "grounds" the pursuit of a course of study or research in this University; association with the academic work of the University; or similar qualifications.

Admission "ad eundem gradum" is not granted merely as a titular distinction.

Academic Dress.

Professors, Lecturers, and Students are required to wear academic dress at lectures, except in those cases in which a dispensation shall have been granted by the Faculty.

Attendance and Conduct.

1. Punctual attendance on all his classes is required of each student.

2. A record shall be kept by each Professor or Lecturer, in which the presence or absence of Students shall be carefully noted. The record shall be submitted to the Faculty at all their ordinary meetings during the Session.

3. Credit for attendance on any lecture or class may be refused on the grounds of lateness, inattention, neglect of study, or disorderly conduct in the class-room or laboratory. In the case last mentioned, the student may, at the discretion of the Professor, be required to leave the room. Persistence in any of the above offences against discipline shall, after

admonition by the Professor, be reported to the Dean of Faculty. The Dean may, at his discretion, reprimand the student, or refer the matter to the Faculty at its next meeting, and may in the interval suspend from classes.

4. Absence from lectures can only be excused by necessity or duty, of which proof must be given, when called for, to the Faculty. The number of times of absence, from necessity or duty, that shall disqualify from the keeping of a session shall in each case be determined by the Faculty.

5. Any student found guilty of dishonest practices at an examination shall be liable to expulsion from the University, or to be suspended for a term of years.

6. While in college, or going to or from it, Students are expected to conduct themselves in the same orderly manner as in the class-rooms. Smoking is prohibited in the College buildings, except in such rooms, if any, as may be set apart for that purpose. Any Professor observing improper conduct in the College buildings or grounds may admonish the student, and, if necessary, report him to the Dean. Without, as well as within the walls of the College, every student is required to maintain a good moral character.

7. When students are brought before the Faculty under the above rules, the Faculty may reprimand, report to parents or guardians, impose fines, disqualify from competing for prizes or honours, suspend from classes, or report to the Corporation for expulsion.

8. Any student damaging the furniture or buildings will be required to bear the expense of repairing or making good the same, and will, in addition, be subject to such other penalty as the Faculty may see fit to inflict. If individual responsibility for damage cannot be traced, a *pro rata* assessment may be made on all the students more directly concerned.

9. All cases of discipline involving the interests of more than one Faculty, or of the University in general, shall be immediately reported to the Principal, or, in his absence, to the Vice-Principal.

10. Petitions from the students to any University body on any subject can, in general, be taken into consideration only at the regular meetngs appointed in the Calendar.

Conduct of Examinations.

1. The supervision of the examinations of the University is entrusted largely to officers specially appointed from year to year in sufficient numbers for the purpose. An attendant is present in the Examination Hall throughout each examination.

2. Writing paper for the examinations is provided in the form of books, with covers in special colours. Each book contains a statement of the duties of candidates, and to each is attached a small envelope containing a card or slip for the name of the candidate.

3. Each colour has a number, and only one colour is employed at a given examination. A certain scheme of colours is arranged beforehand for the whole period of the examination.

4. The seating of the students is arranged in advance, and is posted at the entrance of the Hall fifteen minutes before the commencement of the examination.

5. The Faculty, or a Committee of the Faculty concerned, will arrange for at least one examiner, and such other paid examiners as are deemed necessary, to be present in the Hall for each examination ; and will also arrange the scheme of seating and books to be used.

6. All examiners are expected to attend strictly to the supervision of the examinations while they are in the Hall.

7. They shall instruct each candidate to write the number of his table on the outside of his book ; to write his name plainly upon the card provided in the envelope on the book; to replace it and seal the envelope.

After this has been done, the examination papers are distributed. Any candidate entering late will be required to

sign his card and close the envelope before receiving the examination paper.

The examiners shall also call the attention of the candidates to the rules printed upon the envelope.

8. During the course of the examinations the examiner shall verify the position of each candidate in the examination hall according to a plan.

9. For the convenience of candidates, the examiners may announce the time when half of the period allowed for the examination has expired; and also at thirty minutes and five minutes before the close.

10. Before beginning to write on the examination, candidates should write their names plainly on the slip provided in the envelope, and enclose it, fastening the envelope, and write the number of their desk or table plainly on the cover of the examination book.

11. No candidate shall be permitted to enter the examination room after the expiry of one-half hour, or leave it before the expiry of one-half hour, from the commencement of the examination. Any candidate leaving the examination room after the issue of the examination papers in any subject, shall not be permitted to return during the course of that examination.

12. Candidates guilty of any of the following or similar dishonest practices shall be immediately dismissed from the examination, and shall be liable to permanent disqualification for membership in McGill University :—

A. Making use of any books, papers, or memoranda, other than those provided by the examiners.

B. Speaking or communicating with other candidates under any circumstances whatever.

C. Exposing written papers to the view of other candidates.

The plea of accident or forgetfulness shall not be received.

13. Candidates shall write their answers on the right hand pages of the Regulation Answer Book provided for the pur-

pose by the University, entering on the margin nothing but the number or letter of the question they are about to answer. The left-hand page may be used for rough drafts or for scribbling puposes. No other paper than the regulation answer book above mentioned shall be used by the candidates, and no pages removed from the books.

14. Candidates are not permitted to leave their places. Should they desire anything, they may signify it by standing up.

15. When the examiner announces that the examination is over, all candidates must leave the hall. On leaving the hall, the examination books must be deposited by the candidates as directed by the examiners.

Regulations Concerning the Management of the College Grounds and Athletics.

All matters relating to the management of the College Grounds and of Out-Door Athletics and Sports are under the control of a Committee consisting of :—

One Governor.
The Principal.
One Member of the Faculty of Arts.
One Member of the Faculty of Applied Science.
One Member of the Faculty of Law.
One Member of the Faculty of Medicine.
One Member of the Faculty of Comparative Medicine.
One Graduate.
One Undergraduate, member of the Football Club.
One Undergraduate, member of the Tennis Club.
One Undergraduate, member of the Cricket Club.
One Undergraduate, member of the Hockey Club.
One Undergraduate, member of the Skating Club.
The President of the Athletic Association.

The several Members of the Committee are elected annually by their respective bodies ; and the Committee meets for organization on the third Tuesday in September in each year. The Undergraduate Members of the Committee are entitled to vote only on matters relating to Athletics.

The following extracts are made from the rules and regulations of the Committee, for the guidance of Members of the University and the several Athletic Clubs and Associations which are from time to time permitted to use the grounds:

The University and McTavish Street gates shall be closed between 6 p.m. and 7 a.m. on week days and the whole day on Sunday.

The Sherbrooke Street gates shall be closed between 10 p.m. and 6 a.m.

Such persons as are entitled to use the Grounds shall be provided with tickets renewable each year.

Those entitled to tickets are the Members of the University and prominent Benefactors, and the families of Governors and Professors.

The several Clubs shall be permitted to issue special tickets, entitling the holders to admission to the Grounds for the purpose of viewing matches, or for other special occasions of public interest.

All Students desirous of taking part in football matches, or otherwise engaging in violent athletic contests, must pass a medical examination, to be held under the direction of the Superintendent of the Gymnasium. A complete record of all such examinations shall be kept by the Superintendent or other officer appointed to this duty. The Managers and Captains of Clubs or other responsible executive officers are required to insist upon the strict observance of the rule in regard to Medical Examination, and all the rules and regulations of the Committee which concern them.

All Clubs must submit their Regulations, Rules, and By-Laws, and any changes in the same, for the approval of the Committee. They must make application for the use of such portions of the Grounds as they require, and for any special privileges.

Clubs must not engage in matches with outside clubs except with the approval of the Committee.

The Athletic Association must submit its programme for each year for the approval of the Committee.

All Students of the University are required to pay a fee of three dollars ($3.00) for the use of the Grounds. The amount so paid is handed over to the Committee, and is by it expended in the interest of College Athletics and in the permanent improvement of the portions of the grounds used for Athletics.

Examinations in Music.

An arrangement has been made whereby the University has undertaken, in conjunction with the Associated Board of the Royal Academy of Music and the Royal College of Music, London, England, to carry on throughout Canada the Examinations in Music hitherto conducted by the Associated Board alone. Under this arrangement, the University will be responsible for the proper and effective conduct of the Examinations, and successful candidates will be entitled to receive certificates bearing the imprimatur of the University as well as that of the Associated Board.

These examinations comprise School Examinations (Elementary, Lower and Higher divisions) and Local Centre Examinations (Junior and Senior grade)—the Senior grade of the Local Centre calling for a high degree of proficiency. They are theoretical and practical in character, embracing Rudiments of Music, Harmony and Grammar of Music, Counterpoint, Pianoforte, Organ, Violin, Harp, Wind Instruments, Singing, etc.

The examinations in Practical subjects will be held during May and those in Theory in the early part of the month of June.

Full details of the requirements for each examination, fees, etc., are published in a separate syllabus, which can be obtained, together with specimen Theory papers and full information, on application to the Registrar of the University.

University Buildings.

The Centre Building.

This building, the first and oldest building of McGill College, contains the lecture-rooms of the Faculty of Arts and the Botanical Laboratories in the centre. The East Wing contains the newly equipped Zoological Laboratories, the offices of the Administration, and the lecture-rooms of the Faculty of Law. The West Wing comprises the Molson Convocation and Examination Hall and the Corporation Meeting-room.

The Botanical Laboratories are described in detail on p. 146, the Zoological Laboratories on p. 147.

The Macdonald Engineering Building.

The Engineering Building, erected, equipped and endowed by Sir William C. Macdonald, represents, in architectural effect, a severe treatment of the Italian renaissance. Besides numerous lecture-rooms, students' rooms, a departmental library, and a large technical museum, which holds the Reuleaux collection of Kinematic models—believed to be the most complete in America, the building contains large and thoroughly equipped electrical and magnetic laboratories; dynamo rooms; lighting station; accumulator room; laboratories of Mathematics, Dynamics, Mechanics, Geodesy, Modelling, Testing, and Thermodynamics; workshops (in the annex erected under the bequest of the late Thomas Workman) for Carpentry, Wood-turning, and Pattern-making; Machine shops; Smithy; Foundry; etc.

The whole of one floor is given up to Drawing-rooms, and the Museum of the building contains a large collection of casts illustrative of the historical development of the various styles of architecture and of casts of architectural and figure sculpture.

A detailed description of the laboratories and workshops and their equipment is given on pp. 220 *et seqq.*

Macdonald Chemistry and Mining Building.

Admirable facilities are afforded in the Macdonald Chemistry and Mining Building for study and research in the various departments of Chemistry. The building, also erected, equipped and endowed by Sir William C. Macdonald, is spacious, admirably lighted, heated by hot water, and ventilated by means of electric fans, one placed in the basement and two in the attic. In addition to the main lecture-room, which seats about 250 students, the building contains three large general Chemical Laboratories, and a number of smaller

laboratories and rooms for special purposes, including research work in Inorganic and Organic Chemistry and in Mineralogy and Petrography. Among the special laboratories may be mentioned those for Organic Chemistry, Physical Chemistry, Electrolytic Analysis, Gas Analysis, Iron and Steel Analysis, Water Analysis, Photography, Determinative Mineralogy, etc.

A detailed description of the laboratories and workshops and their equipment is given on pp. 220 *et seqq.*

The Mining and Metallurgical Laboratories are in the Chemistry and Mining building, and comprise Mining and Ore-dressing, Milling, Metallurgical Assay and wet assaying laboratories ; Lecture-rooms ; Library; Drawing-room ; etc. The machinery of these laboratories is of full size, and all investigations can be carried out in all respects under working conditions.

A detailed description of the laboratories and their equipment is given on pp. 220 *et seqq.*

The Macdonald Physics Building.

The Macdonald Physical Laboratory, another of Sir William C. Macdonald's gifts to the University, contains five storeys, each of 8,000 square feet area. Besides a lecture theatre and its apparatus rooms, the Building includes an elementary laboratory nearly 60 feet square; large special laboratories arranged for higher work by advanced students in Heat and Electricity ; a range of rooms for optical work and photography; separate rooms for private thesis work by students; and two large laboratories arranged for research, provided with solid piers and the usual standard instruments. There are also a lecture room, with apparatus room attached, for Mathematical Physics, a special physical library, and convenient workshops. The equipment is on a corresponding scale, and comprises : (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the students in practical work; (3) the most recent types of all important instruments for exact measurement, to be used in connection with special work and research.

A detailed description of the laboratories and their equipment is given on pp. 220 *et seqq.*

Medical Buildings

The present main building of the Faculty of Medicine was erected in 1873. In 1885, and again in 1893, large additions and alterations were made to the buildings. These again, however, have proved inadequate, and a thorough reconstruction and enlargement of the buildings has lately been completed. The present buildings comprise several large lecture theatres, a large reading-room, managed by the

students themselves; a fine medical library; dissecting-rooms; and a large number of completely equipped laboratories for Physiology, Histology, Pharmacology, Chemistry, Hygiene, Bacteriology, and Pathology, in addition to numerous museums, preparation rooms, and offices. Clinical teaching is conducted in the theatres, wards, out-patient rooms, and laboratories of the Montreal General Hospital, the Royal Victoria Hospital, and the Montreal Maternity Hospital.

A detailed description of the laboratories and museums is given on pp. 264 *et seqq.*

The Royal Victoria College for Women.

This residential college for the Women Students of McGill University, erected and endowed by Lord Strathcona and Mount Royal, is situate on Sherbrooke Street, in close proximity to the University buildings and laboratories. The Professors and Lecturers of the University are thereby enabled to give their services in the conduct of the College classes.

Full particulars of the College, terms of residence, etc., are given on pp.. 153 *et seqq.*

Veterinary College.

The lecture-rooms, laboratories and pharmacy of the Faculty of Comparative Medicine and Veterinary Science are situate on Union Avenue, where hospital and daily clinics are held. An extensive out-door practice in the largest stables of the city and numerous farms also afford opportunities for clinical observation.

A detailed description of the laboratories and museums is given on pp. 333 *et seqq.*

The University Library.

Librarian :—Charles H. Gould, B.A.

The general library is housed in the building erected by the late Mr. Peter Redpath, which affords ample accommodation for two hundred readers. The reading room, which contains a reference library and leading English and foreign periodicals, is exceptionally spacious and convenient, and is open in the evening.

The important addition to the library building, which has recently been erected by Mrs. Peter Redpath, is now complete. Besides providing a large new book stack, it contains several seminary rooms and commodious quarters for a special Law Library.

The various Libraries of the University now contain upwards of 88,000 volumes, and a large number of pamphlets.

The books have been selected with a view to illustrating the several courses of University study. They are, therefore, to a con-



University Library.

siderable extent, general in character; and the Committee endeavours to provide for the symmetrical growth of the entire library.

There are, however, several large special collections, besides the departmental libraries. The late Mr. Peter Redpath was, for years before his death, engaged in forming the REDPATH HISTORICAL COLLECTION. This is still being added to by Mrs. Peter Redpath, is now of great value, and affords unusual opportunities for the study of English History. An important feature of the collection is a series of 3,500 political and religious tracts, which date from 1601 to about the middle of the last reign.

Abundant materials, bearing upon the History of Canada, have been gathered together. Of these the nucleus is formed by the entire library of the late Mr. Frederick Griffin, whose choice books were, some years ago, bequeathed to the University. This branch of the library is being steadily augmented.

The Medical Library, directly controlled by the Faculty of Medicine, is the largest of the departmental libraries, and is one of the most complete collections of its kind in the Dominion.

About 220 current periodicals, literary and scientific, are subscribed for through the various departments of the University. Besides these, the library regularly receives Serials, Transactions and Proceedings of Societies. The list of both periodicals and serials is being extended yearly.

The generosity of the fanily of the late Mr. Hugh McLennan has enabled the Library Commitee to establish and operate for the past year a system of travelling libraries. These are sent on application, and the payment of a nominal fee of $3, to any point in Canada. The regulations and full particuars may be obtained from the Librarian of the University.

Although the library is naintained primarily for members of the University, the Corporation has provided for the admission, upon certain conditions, of such persons as may be approved by the Library Committee. It is the desire of the Committee to make the library as useful to the entre community as is consistent with the safety of the books and the general interests of the University.

Extract from the Library Regulations.

1. During the College Session the Library is open daily (except Sundays and general public holidays), from 9 a.m. till 5 p.m.; and the Reading Room from 9 a.m. till 6 p.m., and also from 7.30 till 10.30 p.m. On Saturdays, both Library and Reading Room close at 5 p.m. During vacations both Library and Reading Room close at 5 p.m., and on Saturdays at 1 p.m.

2. Students in the Faculty of Arts, of Law, and of Applied Science are entitled to read in the Library, and may borrow books (subject to the regulations) to the number of three volumes at one time.

3. Students in the Faculties of Medicine or Comparative Medicine, who have paid the Library fee to the Bursar, may read in the Library, and on depositing the sum of $5 with the Bursar, may borrow books on the same conditions as Students in other Faculties. They are required to present their Matriculation Tickets to the Bursar and to the Librarian.

4. Graduates in any of the Faculties, on making a deposit of $5, are entitled to the use of the Library, subject to the same rules and conditions as Students in Arts, Law, or Applied Science.

5. Books may be taken from the Library only after they have been charged at the Delivery Desk; borrowers who cannot attend personally must sign and date an order, giving the titles of the books desired.

6. Books in the Reference Library must not be taken from the Reading Room; and, after they have been used, they must be returned promptly by readers to their proper places upon the shelves.

7. Before leaving the Library, readers must return the books they have obtained to the attendant at the Delivery Desk.

8. All persons using books remain responsible for them so long as the books are charged to them, and borrowers returning books must see that their receipt is properly cancelled.

Writing or making any mark upon any book belonging to the Library is unconditionally forbidden. Any person found guilty of wilfully damaging any book in any way shall be excluded from the Library; and shall be debarred from the use thereof for such time as the Library Committee may determine.

10. Damage to or loss of books, maps, or plates, and injury of Library fixtures, must be made good to the satisfaction of the Librarian and of the Library Committee.

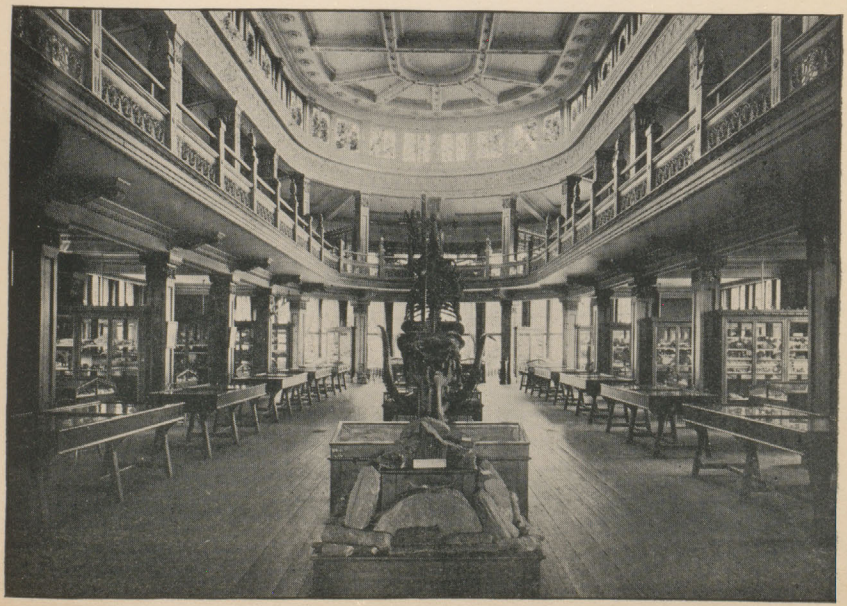
Damage, loss, or injury when the responsibility cannot be traced will be made good out of the caution money deposited by students with the Bursar.

11. Should any borrower fail to return a book upon the date when its return is due, he may be notified by postal card of his default, and be requested to return the book. If the loan is not renewed, or the book returned, after a further delay of at least three days, it may be sent for by special messenger, at the borrower's expense.

12. Before the close of the session, Students in their final year must return uninjured, or replace to the satisfaction of the Librarian, all books which they have borrowed.



University Library.—Main Reading Room.



Redpath Museum.—Interior View.

13. Silence must be strictly observed in the Library.

14. Infringement of any of the rules of the Library will subject the offender to a suspension of his privileges, or to such other penalty as the nature of the case may require.

The Peter Redpath Museum.

Senior Curator—Prof. B. J. Harrington, M.A., LL.D.

This building was erected in 1882 by the liberal benefactor whose name it bears. It occupies a commanding position at the upper end of the campus, and besides its central hall and other rooms devoted to the collections, contains a large lecture theatre, class-rooms, and work-rooms.

The general arrangement of the collections is as follows :—

1. The Botanical Room on the ground floor contains the Herbarium, consisting of 30,000 specimens of Canadian and exotic plants and collections illustrating structural and economic botany.

2. On the first floor is a room over the entrance hall, in which are cases containing archaeological and ethnological objects with large slabs of fossil foot-prints on the walls.

3. This room opens into the great Museum Hall, on each side of which are alcoves with upright and table cases containing the collections in Palaeontology, arranged primarily to illustrate the successive geological systems, and subordinately to this, in the order of zoological and botanical classification, so as to enable the student to see the general order of life in successive periods, and to trace any particular group through its geological history.

4. At the extreme end of the Hall are placed the collections of minerals and rocks, arranged in such manner as to facilitate their systematic study. In the centre of the Hall are economic collections and large casts and models.

5. In the upper story or gallery of the great Hall are placed the zoological collections ; the invertebrate animals in table cases in regular series, beginning with the lower forms ; the vertebrate animals in upright cases, in similar order. The PHILIP CARPENTER COLLECTION of shells is especially noteworthy for its arrangement and completeness.

Details as to the several departments of the Museum are given in the "Museum Guide," and papers or memoirs relating to type specimens in the collections can be obtained from the Museum Assistant. Tickets are issued to students by the Professors in charge of the several departments, and classes of pupils from schools can be admitted on certain days, under regulations which may be learned from the Professors or from the Registrar of the University.

Observatory.

Latitude, N. 45° 30′ 17″. Longitude, $4^{h.}$ $54^{m.}$ $18^{s.}$ 67.

Height above sea level, 187 feet.
Superintendent—C. H. McLeod, Ma.E.

The Observatory in which courses of instruction are given in the use of meteorological instruments and in astronomical work, is situated at the head of the University campus.

Meteorological observations.—Records of temperature, atmospheric pressure, wind velocity and direction, and sunshine are obtained by self-recording instruments. Check observations are made at 7.40 a.m., 3 p.m., and 7.40 p.m. on standard instruments.

The principal instruments employed are two standard mercurial barometers; one Richard barograph; one Richard thermograph, one Callendar thermograph ; one Kew standard thermometer ; two Pastorelli thermometers ; one maximum thermometer ; one minimum thermometer; one set of six self-recording thermometers, with controlling clock, battery, etc.; two anemometers; one wind vane; one anemograph with battery, etc.; one sunshine recorder; one rain-band spectroscope and one rain guage.

The Anemometer and Vane are on the summit of Mount Royal, at a point about three-quarters of a mile north-west of the Observatory. They are 57 feet above the surface of the ground and 810 feet above sea level.

Soil temperatures are observed, in co-operation with the Physical Laboratory, by means of platinum thermometers at depths ranging from one inch to nine feet.

The astronomical equipment consists of :—The Blackman Telescope (6¼ in.); a photoheliograph (4½ in.); a 3¼ in. transit with striding level, etc. ; a prismatic (8cm.) transit instrument, also arranged as a zenith telescope; a 2 in. transit in the prime vertical; two collimating telescopes; one sidereal clock; one mean time clock; one sidereal chronometer ; one mean time chronometer ; one chronograph ; batteries, telegraph lines, and sundry minor instruments.

Observations for clock errors are made on nearly every clear night. Time exchanges are regularly made with the Toronto observatory. Time signals are distributed throughout the city by means of the noon time-ball, continuous clock-signals, and the fire-alarm bells; and to the country, through the telegraph lines.

The longitude of the Observatory was determined in 1892 by direct telegraph connection with Greenwich, with exchange of observers and instruments. The position is believed to be the most accurately determined in America.

Gymnasiums.

The University Gymnasium.

Medical Examiner and Instructor:—R. Tait McKenzie, B.A., M.D.

The classes, which are open to men Students of all the Faculties, will meet at the University Gymnasium at hours to suit, as far as possible, the convenience of Students, and to be announced at the commencement of the Session.

The recent addition of some special apparatus enables the instructor to devote some attention to the application of exercise in treating special cases of weakness or deformity, which should be reported to him before the regular class work is undertaken.

THE WICKSTEED SILVER AND BRONZE MEDALS FOR PHYSICAL CULTURE (the gift of Dr. R. J. Wicksteed) are offered for competition to Students of the graduating class and to Students who have had instruction in the Gymnasium for two sessions; the silver medal to the former, the bronze medal to the latter.

The award of these medals is made by Judges, appointed by the Corporation of the University.

Every competitor for the silver medal is required to lodge with the Judges, before the examination, a certificate of good standing in the graduating class signed by the Dean or Registrar of the Faculty to which he belongs, and the Medal will not be awarded to any Student who may fail in his examination for the degree.

The Royal Victoria College Gymnasium.

Instructor :—Miss Vendla M. Holmstrom.

Classes for Women Students are conducted in the newly equipped Gymnasium of the Royal Victoria College, see page 155.

Faculty of Arts.

THE FIRST DAY OF LECTURES, SESSION 1902-1903, WILL BE TUESDAY, SEPTEMBER 23RD.

I. Regulations for Entrance.

See pp. 10—21.

II. Scholarships and Exhibitions.*

General Regulations.

1. A Scholarship is tenable for *two* years; an Exhibition for *one* year.

2. Scholarships are open for competition to Students who have passed the University Intermediate Examination, provided that not more than three sessions have elapsed since their Matriculation; and also to Candidates who have obtained what the Faculty may deem equivalent standing in some other University, provided that application be made before the end of the Session preceding the examination.

3. Scholarships are divided into two classes:—(1) *Science Scholarships*; (2) *Classical and Modern Language Scholarships*. The subjects of examination for each are as follows:

Science Scholarships.—Mathematics—Differential and Integral Calculus; Analytic Geometry; Plain and Spherical Trigonometry; Higher Algebra and Theory of Equations. Natural Science—Chemistry; Logic. For details, see p. 59).

* In Session 1902-1903 the Scholarship and Exhibition Examinations will begin Wednesday, September 10th.



Arts Building.

Classical and Modern Language Scholarships.—Greek, Latin, English Compositions; English Language and Literature; French or German. (For details, see p. 60).

4. Exhibitions are assigned to the First and Second Years.

First Year Exhibitions are open for competition to candidates for entrance into the First Year.

Second Year Exhibitions are open for competition to Students who have passed the First Year Sessional Examinations, provided that not more than two sessions have elapsed since their Matriculation; and also for candidates for entrance into the Second Year.

The subjects for examination are as follows:—

First Year Exhibitions.—Classics, Mathematics, English Language and Literature, French, or German.

For regulations under the new scheme for 1903 and following years, see p. 5.

Second Year Exhibitions.—Classics, Mathematics, English and Modern History, French or German.

5. The First and Second Year Exhibition Examinations will, for Candidates who have not previously entered the University, be regarded as Matriculation Examinations.

6. No student can hold more than one Exhibition or Scholarship at the same time.

7. Exhibitions and Scholarships will not necessarily be awarded to the candidates who have obtained the highest marks. An adequate standard of merit will be required.

8. If in any College Year there be not a sufficient number of candidates showing adequate merit, any one or more of the Exhibitions or Scholarships offered for competition may be given to more deserving candidates in another year.

9. A successful candidate must, in order to retain his Scholarship or Exhibition, proceed regularly with his College Course to the satisfaction of the Faculty.

10. The annual income of the Scholarships or Exhibitions will be paid in four instalments, viz.:—In October, December, February and April, about the 20th day of each month.

11. The Examinations will be held at the beginning of every session.

For the session of 1902-1903 there are twenty-five Scholarships and Exhibitions, including the following:—

The Jane Redpath Exhibition, founded by Mrs. Redpath, of Terrace Bank, Montreal:—value, about $90 yearly, open to both men and women.*

The George Hague Exhibition, given by George Hague, Esq., Montreal, for the encouragement of the study of Classics:—value $125 yearly.

Ottawa Valley Graduates' Society Exhibition, awarded on the results of the June Examination.

The Sir William Dawson Exhibition, given by the New York Graduates' Society:—value $60 yearly.

Ten Macdonald Scholarships and Exhibitions, founded by Sir W. C. Macdonald, Montreal:—value $125 each, yearly.

The Charles Alexander Scholarship (for men students), founded by Charles Alexander, Esq., Montreal, for the encouragement of the study of Classics and other subjects:—value $90 yearly.

The Major H. Mills Scholarship, founded by bequest of the late Major Hiram Mills:—value $100 yearly.

The Barbara Scott Scholarship, founded by the late Miss Barbara Scott, Montreal, for the encouragement of the study of the Classical languages and literature:—value, $100 to $120 yearly.

The Mackenzie Scholarship for Economics and Political Science, founded in memory of the late Hon. Alexander Mackenzie:—value $125 yearly.

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* Resolutions are now in force by which all Exhibitions and Scholarships have been thrown open without restriction of sex, "except in cases where the deeds of gift or the ascertained wishes of the donor expressly preclude such a course; it being understood that in the event of the establishment of any large number of Exhibitions and Scholarships specially appropriated to either of the sexes by the terms of the foundation, the Board of Governors may again restrict some of those now existing in favour of the other sex."

Six Exhibitions in the Royal Victoria College, open to women only:—ranging in value from $75 to $200 yearly.
One Royal Victoria College Scholarship, for women:—value $125 yearly.

First Year Exhibitions.

First Year Exhibitions.

The First Year Exhibition Examinations will be held at McGill College, Montreal, beginning Wednesday, 10th September; and also at any of the following centres, provided that application in writing be made to the Secretary of the Board of Matriculation Examiners by intending candidates not later than 19th August, viz.—

Toronto, Kingston and Ottawa, Ont.; Halifax, N.S.; St. John, N.B.; Charlottetown, P.E.I.; Winnipeg, Man.; Victoria and Vancouver, B.C.; St. John's, Nfld.

No application received after 19th August will be considered.

All the other Entrance, Exhibition and Scholarship Examinations of September, 1902, will be held at McGill College only.

The following exhibitions will be offered for competition in September, 1902:—

Four of	$125	open to men and women.
Four of	100	" " " "
One of	60	" " " "
*One of	200	" women only, and conditional on residence in the R.V.C.
*Three of	100	" women only, and conditional on residence in the R.V.C.

Note.—In 1903 the First Year Exhibition Examination will be held in June instead of September, and a certain number of Exhibitions will be awarded for proficiency in the Ordinary Matriculation Examinations only. Exhibitions of higher value will be offered for an Advanced Examination (see p. 51).

* One or more of these exhibitions may be given to candidates entering the Second Year. A modern Language may be substituted for Greek.

The following are the requirements in the various subjects of examination:—

Latin.

A paper on Latin Grammar; Translation at sight from easy Latin authors; easy Latin Prose Composition; Translation from the following prescribed books:—

*1902 (*a*) Caesar, De Bello Gallico, IV and V.
(*b*) Virgil, Aeneid, II.
(*c*) Horace, Odes I, *or* Cicero, in Cat. III, IV.

For subjects for 1903–1904, see p. 52.

Candidates may substitute an equivalent amount from the works prescribed for the Honour Matriculation Examination of the University of Toronto.

Greek.

A paper on Greek Grammar; Translation at sight from easy Greek authors; easy Greek Prose Composition; Translation from the following prescribed books:—

‡1902 (*a*) Xenophon, Anabasis, I *or* II.
(*b*) Homer, Odyssey XVII.
(*c*) Euripides, Hecuba (Sidgwick's Scenes), *or* Homer, Iliad I *or* VI.

For subjects for 1903–1904, see p. 53.

Candidates may substitute an equivalent amount from the works prescribed for the Honour Matriculation Examination of the University of Toronto.

In both Latin and Greek, candidates who do not offer the books prescribed above will have the option of an additional paper in Composition and Translation at Sight.

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* In 1902 and 1903 candidates may substitute, for (*a*) and (*b*) together, the following Ontario subjects:—Cornelius Nepos, Lives of Themistocles, Aristides; Cæsar, De Bello Gallico IV. (omitting c. 17) and V. 1-23; Virgil, Aeneid II. 1-505.

† In 1902 candidates may substitute for (*a*) the corresponding Ontario subjects, viz:—Xenophon, Anabasis I, the portions contained in White's Beginners' Greek Book, pp. 304-428.

Text-books.—Sonnenschein's *or* Rutherford's Greek Grammar, *or* Burnet's Greek Rudiments, *or* White's First Greek Book; Abbott's Arnold's Greek Prose Composition; Sonnenschein's *or* Allen and Greenough's Latin Grammar; Arnold's Latin Prose Composition by Bradley, *or* Collar's Latin Composition, Pts. III and IV.

Mathematics.

1902—*Euclid,* Bks. I, II, III, IV and VI; Definitions of Bk. V ; and easy deductions.

Algebra :—Elementary rules ; Involution ; Evolution ; Fractions ; Indices ; Surds ; Simple and Quadratic Equations of one or more unknown quantities.

Trigonometry:—Measurement of angles; Trigonometrical ratios or functions of one angle, of two angles, and of a multiple angle, as in Lock's Elements of Trigonometry, chaps. I-XII, or similar text-books.

English.

Grammar.—An advanced knowledge of this subject will be required, and, in addition, some acquaintance with the historical development of English, as illustrated in common and important words. The candidate is recommended to read Mason's *or* West's Elements of English Grammar and expected to supplement Mason or West by using Morris's Historical Outlines of English Accidence (Macmillan), as a book of reference. *Literature.*—The works to be read are those selected for the Matriculation Examination with the addition of Milton's L'Allegro and other short poems, ed. Bell (Macmillan), and the following essays of Macaulay :—Ranke's History of the Popes ; Frederick the Great.* *Composition.*—The Candidate will be required to write an essay on some subject connected with the literature prescribed.

* For 1903 :—Bacon, Addison, Warren Hastings.

French.

(*a*) Grammar, including Syntax ; (*b*) Translation at sight of French into English ; (*c*) Translation at sight of easy English prose passages into French ; (*d*) Translation from the following texts :—

For 1902, Sarcey, Le Siège de Paris (Heath & Co.) ; Sandeau, Mademoiselle de la Seiglière (Heath & Co.) ; About, Le Roi des Montagnes (Heath & Co.) ; *or*, if one month's notice be given to the Secretary of the Board of Matriculation Examiners, candidates may substitute for the foregoing texts those prescribed for the Senior Matriculation Examination of the University of Toronto *or* of Dalhousie University, and for the Leaving Examinations of Nova Scotia.

Or, instead of French:—

German.

(a) Grammar, Accidence and Syntax (as much as is contained in Joynes-Meissner or Van der Smissen) ; (*b*) Translation at sight from German into English ; (*c*) Translation at sight into German of an easy passage of English prose ; (*d*) Translation and grammatical study of the following texts :—

For 1902 : Sudermann, Der Katzensteg (Heath & Co.) ; Schiller, Wilhelm Tell (Macmillan & Co.), *or* Leander, Träumerien (Copp, Clark Co.) ; Gerstaecker, Germelshausen (Heath & Co.) ; *or*, if one month's notice be given to the Secretary of the Board of Matriculation Examiners, candidates may substitute for the foregoing texts those prescribed for the Senior Matriculation Examination of the University of Toronto *or* of Dalhousie University, and for the Leaving Examinations of Nova Scotia.

The First Year Exhibitions will be awarded to the best candidates in the above subjects, provided there be absolute merit.

But in subsequently distributing the Exhibitions of higher value among the successful candidates, work in the following subjects will be taken into account also :—

1. **Latin and Greek.**—Higher Composition and Translation at Sight.

2. **Mathematics.**—The remainder of Mathematics (Part II); see p. 49.

3. **English.**—Henry Morley's First Sketch of English Literature, chaps VII and VIII.

NOTE.—The First Year Exhibition Examination will be regarded as an Entrance Examination.

First Year Exhibitions.

First Year Exhibitions 1903.

In the year 1903 and following years, the First Year Exhibitions will be awarded under a new scheme ; they will be divided into three classes, A (Matriculation), B (Higher) and C (Advanced), and the examination will be held in June.

(I) The A (Matriculation) Exhibitions will be awarded on the results of the Matriculation Examination only ; for list of subjects see pp. 13–20.

(II) The B (Higher) Exhibitions will be awarded on the results of an examination on the Matriculation Subjects, together with Additional Subjects.

A candidate will be required to take as Additional Subjects three of the following :—

English.
Latin.
Greek.
French.
German.
Mathematics, Part II (if not taken for Matriculation).

The details of the requirements in the above additional subjects are as follows :—

English.

Grammar.—An advanced knowledge of this subject will be required, and, in addition, some acquaintance with the historical development of English as illustrated in common and important words. The candidate is recommended to read Mason's or West's Elements of English Grammar, and expected to supplement Mason or West by using Morris's Historical Outlines of English Accidence (Macmillan & Co.) as a book of reference.

Literature, 1903 and 1904.—Milton, L'Allegro and other short poems; ed. Bell (Macmillan & Co.); Macaulay, Essays on Byron, Warren Hastings, Clive.

Composition.—The candidate will be required to write an essay on some subject connected with the examination.

Provided two months' notice be given, candidates may substitute in any year an equivalent amount from the works prescribed for the Senior Leaving Examination of the Province of Ontario, Grade XII of the Province of Nova Scotia, or the Senior Leaving Examination of the Prince of Wales College, P.E.I.

Latin.

Grammar.—Translation at Sight ; Prose Composition ; Translation from the following prescribed books :—

1903 and 1904, Horace, Odes III.

Provided two months' notice be given, candidates may substitute in any year an equivalent amount from the works prescribed for the Senior Leaving Examination of the Province of Ontario, Grade XII of the Province of Nova Scotia, or the Senior Leaving Examination of the Prince of Wales College, P.E.I.

Greek.

Grammar.—Translation at Sight ; Prose Composition ; Translation from the following prescribed books :—

1903 and 1904, Homer, Odyssey VII; Euripides, Hecuba (Sidgwick's Selections).

Provided two months' notice be given, candidates may substitute in any year an equivalent amount from the works prescribed for the Senior Leaving Examination of the Province of Ontario, Grade XII of the Province of Nova Scotia, or the Senior Leaving Examination of the Prince of Wales College P.E.I.

In both Latin and Greek, candidates who do not offer the books prescribed above will have the option of an additional paper in Composition and Translation at Sight.

Text-books.—Sonnenschein's *or* Rutherford's Greek Grammar, *or* Barnet's Greek Rudiments, *or* White's First Greek Book; Abbott's Arnold's Greek Prose Composition Sonnenschein's *or* Allen and Greenough's Latin Grammar; Arnold's Latin Prose Composition by Bradley, *or* Collar's Latin Composition, Parts III and IV.

French.

(*a*) Grammar, including Syntax ; (*b*) Translation at sight of French into English ; (*c*) Translation at sight of easy English prose passages into French; (*d*) Translation from the following texts :—

1903. Sarcey, Le Siège de Paris (Heath & Co.); Sandeau, Mademoiselle de la Seiglière (Heath & Co.); About, Le Roi des Montagnes (Heath & Co.)

1904. Angier, Le Gendre de M. Poirier (Heath & Co.); DeVigny, La Ganne de Joue (Heath & Co.) ; Sand, La Marc au Diable (Heath & Co.)

Provided two months' notice be given, candidates may substitute in any year an equivalent amount from the works prescribed for the Senior Leaving Examination of the Province of Ontario, Grade XII of the Province of Nova Scotia, or the Senior Leaving Examination of the Prince of Wales College, P.E.I.

German.

(*a*) *Grammar.*—Accidence and Syntax; (*b*) Translation at sight from German into English; (*c*) Translation at sight into German of an easy passage of English prose; (*d*) Translation and grammatical study of the following texts :—

1903. Sudermann, Der Katzensteg (Heath & Co.); Schiller, Wilhelm Tell (Macmillan & Co.), *or* Leander, Träumerien (Copp, Clark Co.); Gerstaecker, Germelshausen (Heath & Co.)

1904. Schiller, Maria Stuart (Heath & Co.); Freytag, Die Journalisten (Heath & Co.); Keller, Kleider machen dente (Heath & Co.)

Provided two months' notice be given, candidates may substitute in any year an equivalent amount from the works prescribed for the Senior Leaving Examination of the Province of Ontario, Grade XII of the Province of Nova Scotia, or the Senior Leaving Examination of the Prince of Wales College, P.E.I.

Mathematics, Part II.

Geometry.—Euclid's Elements, Books IV and VI, with definitions of Book V, and easy deductions.

Algebra.—The three Progressions, Ratio, Proportion, Variation, Permutations and Combinations, Binomial Theorem, Logarithms, Interest and Annuities, as in Hall & Knight's Elementary Algebra, omitting Chapters 36, 40, 41, 42, or in similar text-books.

Trigonometry.—Measurement of Angles, Trigonometrical ratios or functions of one angle, or two angles and of a mul-

tiple angle, as in Hamblin Smith, pp. 1-105, or as in Lock's Elementary Trigonometry, Chapters I-XII, or in similar text-books.

(III) The C (Advanced) Exhibitions, of greater value, will be awarded on the result of an examination as follows:

(*a*) The examination shall include the following subjects:
English (including History).
Mathematics.
Latin.
Greek.
French.
German.

(*b*) In the examination a candidate will be permitted to offer any of the above subjects or all of them, and will not be disqualified from gaining an Exhibition by failure in, or omission of, any subject or subjects.

(*c*) 25 per cent. of the possible maximum in each subject offered will be deducted from the marks obtained by each candidate, and the remainder will be the marks assigned this work.

(*d*) In the awarding of Exhibitions, marked excellence in any subject will be taken into special account.

(*e*) The details of the subjects are as follows:—

English and History.

1903 and 1904. *Language.*—Toller, Outlines of the History of the English Language (Macmillan & Co.)

Literature.—Coleridge, Ancient Mariner, ed. Bates (Longmans); Wordsworth, Selections, ed. Webb (Macmillan & Co.); Tennyson, Selections, ed. Rowe and Webb (Macmillan & Co.); Shakspere, Merchant of Venice, ed. Deighton (Macmillan & Co.), As You Like It, ed. Deighton (Macmillan & Co.), Julius Cæsar, ed. Deighton (Macmillan & Co.)

History.—Green's Shorter History of the English People.

Composition.—An essay on some subject connected with the works specified.

Mathematics.

Geometry.—Euclid's Elements, Books I, II, III, IV, VI, with definitions of Book V and deductions.

A special paper will be set in deductions from the first three books. Candidates are recommended to study the Theorems and Examples in these books in Hall & Stevens' Edition.

Algebra.—Elementary Rules, Involution, Evolution, Fractions, Indices, Surds, Simple and Quadratic Equations of one or more unknown quantities, the three Progressions, Ratio, Proportion, Variation, Permutations and Combinations, Binomial Theorem, Logarithms, Interest and Annuities, as in Hall & Knight's Elementary Algebra, omitting Chapters 36, 40, 41 and 42.

Trigonometry.—Measurement of Angles, Trigonometrical ratios or functions of one angle, two angles, and of a multiple angle, as in Hamblin Smith, pp. 1-105, or as in Lock's Elementary Trigonometry, chapters I-XII, or in similar text-books.

In addition, the Solution of Triangles will be required.

Latin.

Higher Grammar, Higher Prose Composition, and Translation at Sight. Passages for translation from the following books :—

1903 and 1904. Virgil, Aeneid I-VI; Caesar, Bello Gallico; Cicero, Catiline Orations.

Greek.

Higher Grammar, Higher Prose Composition, and Translation at Sight. Passages for translation from the following books :—

1903 and 1904. Homer, Odyssey VI-XII ; Xenophon, Anabasis; Euripides, Hecuba and Alcestis.

French.

Higher Grammar, Higher Prose Composition, and Translation at Sight. Passages for translation from the texts prescribed for the B Exhibitions, and from the following, in Addition:—

1903 and 1904. Thierry, Récits des Temps Merovingiens (Pitt Press); Mme. de Stäel, Le Directoire (Pitt Press).

German.

Higher Grammar, Higher Prose Composition, and Translation at Sight. Passages for translation from the texts prescribed for the A and B Exhibitions, and from the following, in addition :—

1903 and 1904. Lessing, Minna von Barnholm.

Second Year Exhibitions.

Second Year Exhibitions.

Three of $125, open to men and women.
One of $75, open to men and women.
One of $100, open to women only.
One of $75, open to women only.

Greek.

Lucian, Charon and Somnium (Heitland, Pitt Press); Demosthenes, Olynthiacs I and II; Euripides, Medea.

Latin.

Quintilian, X, c. 1 (Peterson, Clarendon Press, smaller edition); Cicero, De Senectute (Howson, Longmans); Horace, Odes, Bk. IV.

Greek and Latin Prose Composition, and Translation at sight.

A paper on Grammar and History.

Text-books.—Oman's History of Greece, chaps. I-XXV (to the outbreak of the Peloponnesian War); and How and Leigh's History of Rome, chaps. XVII-XLIV (from the first Punic War to the Death of Sulla); Abbott's Arnold's Greek Prose Composition, *or* Sidgwick's First Greek Writer; Ramsay's Latin Prose, Vol. I or similar manual.

Mathematics.

Euclid (six books) ; Casey's Sequel to Euclid; Algebra (Hall and Knight's Advanced); Theory of Equations (in part); Trigonometry (as in ordinary course of First Year).

English and Modern History.

Language.—Trench, Study of Words. *Literature.*—Spenser, Faerie Queene, Bk. 1, ed. Percival (Macmillan) ; Tennyson, Selections from Tennyson, ed. Rowe and Webb (Macmillan). *History.*—Church, The Beginning of the Middle Ages (Epochs of Modern History, Longmans). *Composition.*—The candidate will be required to write an essay on some subject connected with the literature or history prescribed.

French.

(*a*) Grammar ; (*b*) Translation at sight of an English passage into French ; (*c*) French composition on a prescribed subject; (*d*) a critical study of the following texts, tested by questions in the French language, to be answered in French :—

Balzac, Eugénie Grandet; Michelet, Pages choisies (chez A. Colin, Paris) ; Daudet, Jack.

Or, instead of French :—

German.

(*a*) Grammar; (*b*) Translation at sight from German into English, and from English into German; (*c*) a critical study of Die Braut von Messina, and of the lives of Schiller and Goethe; (*d*) Translation from the following texts:—

Schiller, Die Braut von Messina, Der Neffe als Onkel ; Hauff, Der Zwerg Nase (Heath & Co.); Riehl, Der Fluch der Schönheit (Heath & Co.); Benedix, Die Hochzeitsreise (Heath & Co.); Schiller, Der Neffe als Onkel; Baumbach, Die Nonna (Heath & Co.).

No Candidate who has been placed in the Third Class in more than one subject can be awarded a Second Year Exhibition.

Th rd Year Scholarships.

Scholarships Third Year.

One of $125 for Mathematics and Logic, open to men and women.

One of $125 for Mathematics and Logic, open to women only.

One of $125 for Natural Science and Logic, open to men and women.

Two in Classics and Modern Languages, viz., one of $125 and one of $90; open to men and women.

One of $125 in Economics and Political Science, open to men and women.

An Exhibition of $75 for Mathematics, arising from the proceeds of the endowment of the Anne Molson Gold Medal, open to men and women.

Mathematics.

Mathematics and Logic, and Science and Logic.

Differential Calculus (Williamson, Chaps. 1, 2, 3, 4, 7, 9; Chap. 12, Arts. 168-183 inclusive; Chap. 17, Arts. 225-242 inclusive). Integral Calculus (Williamson, Chaps. 1, 2, 3, 4, 5; Chaps. 7, Arts. 126-140 inclusive; Chap. 8, Arts. 150-156 inclusive; Chap. 9, Arts. 168-176 inclusive. Analytic Geometry (Salmon), Conic Sections, subjects of chaps. 1-13 (omitting Chap. 8), with part of Chap. 14. Lock, Higher Trigonometry. McLelland and Preston, Spherical Trigonometry, Part I. Salmon, Modern Higher Algebra (first four chapters). Todhunter *or* Burnside and Panton, Theory of Equations (selected course).

Logic.

As in Jevons' Elementary Lessons in Logic.

Chemistry.

Reading.—Mendeléef's Principles of Chemistry. *Essay.*—The interaction of the Haloids with the Alkalies and Alkaline Earths.

Classics and Modern Languages

Two Scholarships, open to both Colleges (viz., one of $125 and one of $90) are offered in Classics and Modern Languages :—

Greek.

Plato, Purves, Selections, pp. 1-21, 55-112 (Clarendon Press) ; Thucydides, Book VI (Marchant, Macmillan) ; Sophocles, Antigone (Jebb, Pitt Press ; *or* Campbell and Abbott, Clarendon Press).

Prose Composition and Translation at Sight.

Latin.

Horace, Epistles, Book I (Wilkins, Macmillan) ; Cicero, Pro Plancio (Auden, Macmillan) ; Virgil, Aeneid, Bk. VI (Sidgwick, Pitt Press) ; Sallust, Catiline.

Prose Composition and Translation at Sight.

Ancient History.

Text-books.—Bury, History of Greece (Macmillan) ; The Peloponnesian War; How and Leigh, History of Rome to the Death of Cæsar (Longmans).

English and History.

Literature.—Shakspere, Tempest, ed. Deighton (Macmillan) ; Milton, Paradise Lost, Books I and II, ed. Macmillan (Macmillan) ; Lamb, Essays of Elia, ed. Hallward and Hill (Macmillan). *History.*—Myers, Mediaeval and Modern History (Ginn), Part I. *Composition.*—The candidate will be required to write an essay on some subject connected with the literature or history prescribed. High marks will be given for this subject.

French.

Candidates will be questioned on the subject matter of the following texts, the lives of their authors, and the literary schools which they represent. The entire examination will be held in the French language:—

For 1902-3, Molière, Tartuffe ; Racine, Iphigénie ; De Vigny, Servitude et Grandeur militaires; De Musset, Les Nuits, Pierre et Camille.

Or, instead of French :—

German.

(*a*) Grammar ; (*b*) Translation at sight from English into German; (*c*) Critical study of the lives of Goethe and Schiller and of those of their works which are mentioned below ; (*d*) Translations from the following texts:—

For 1902, Schiller, Don Carlos; Goethe, Dichtung and Wahrheit (Heath & Co.) ; Immermann, Der Oberhof (Wagner, Pitt Press) ; Meyer, Gustav Adolf's Page (Heath & Co.)

Economics and Political Science.

The subjects of examination are as follows :—

Elements of Political Science.—Seeley, Introduction to Political Science ; Woodrow Wilson, The State, Chaps. I, V, XII to XVI, inclusive.

The Constitution and Government of England.—Macy, The English Constitution, Part. I.

Elements of Economic Theory, viz. : The Scope and Method of Political Economy; the Organization of Production; the Theory of Value; Distribution—rent, wages, interest, profits ; Exchange, including international trade ; the Theory of Money; Principles of Taxation. F. A. Walker, Principles of Political Economy.

History of Economic Theory.—L. L. Price, Political Economy in England.

[Two papers in Economic Theory; one in each of the other subjects. The subject-matter of the papers to be limited to what is treated in the books (or parts thereof) named.]

III. Regulations for Degrees in Arts.

Regulations for the Degree of B.A.

After passing the First Year Matriculation Examination, an Undergraduate, in order to obtain the Degree of B.A. or B.Sc., is required to attend regularly the appointed courses of lectures for four years, and to pass the required Examinations in each year. He cannot take more than the number of

subjects specified for each year without the special permission of the Faculty; nor can he proceed with his course unless he passes each Examination in its assigned order. Failure in the First or Second Year in more than two subjects, and in the Third year in more than one, will entail the passing at the beginning of the following session, of a Supplemental Examination, which shall include *all* the subjects of the previous Sessional Examination. Failure in *one* subject at this Supplemental shall necessarily cause the loss of the session. Undergraduates are arranged in Years, from First to Fourth, according to their academic standing.

1. Ordinary Course for the Degree of B.A.

N.B.—The Arabic numerals refer to the numbering of the courses on pp. 83 et seqq; for example, Greek, 2, refers to the second course given under the head of Classical Literature and History, p. 84.

First Year.

First Year.

Greek, 1, *or* **Latin, 1.**
English, 1A, 1B, 1C, and **History, 1.**
Mathematics, 1.
Latin, 1, *or* **Greek, 1,** *or* **French, 1, 2,** *or* **German, 2.**
Physics, 2.

French cannot be taken as a qualifying option in the First Year, except by students who have passed the Matriculation Examination in French.

An additional Language may be taken as an extra subject in the first two years, if application be made at the beginning of the Session to the Faculty and permission obtained. Credit will be given for it on application to the Faculty.

Advanced Sections.

With a view to the encouragement of higher work, Advanced Sections will be formed in all subjects as far as practicable, and in these Honours may be awarded. Permission to take an advanced section is granted by the professor.

Students taking the work of advanced sections may be excused from the work of the corresponding ordinary sections



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on the recommendation of the professor. No exemptions from other subjects will be granted to students in advanced sections.

Second Year.

Second Year.

(a) English, 2.
(b) Latin, 2, *or* Greek, 2.

Any Three, of which (d), (e), or (g) must be one.

(c) Greek, 2, *or* Latin, 2, *or* a Modern Language.
(d) Mathematics, 3A, including Dynamics, 3B, *or* Elementary Biology, 1.
(e) Chemistry, 1, Laboratory work in addition.
(f) Logic and Psychology, 1A, 1B.
(g) Hebrew, 1.
(h) German *or* French.

Advanced Sections will be formed in the Second Year, as in the First. Advanced Sections.

Third and Fourth Years.

The subjects of the Third and Fourth Years are arranged in the following divisions :— Third and Fourth Years.

Language and Literature.	History, Philosophy and Law.	Science.
English, 3A, 3C, 4A, 4B, any two; or for any two 3C.	History, 2.	Mathematics, 4.
Latin, 3, 4.	Logic and Metaphysics, 3A, 3B.	Mechanics, Geometrical, 6A, 6B. — Optics, and Astronomy, 5A, 5B. — Two Half Courses.
Greek, 3, 4.	Moral Philosophy, 5A, 5B.	Physics : Sound, Light, Heat (full course), 7A, 7B, 7C.
Sanskrit, 1A, 1B.	Political Science, 6.	Electricity and Magnetism (full course), 8.
French, 5, 6.	Economics, 1.	Chemistry, 2, 3, 4; 5, 6, *or* 7, 8.
German, 4, 5.	Roman Law, 1.	Zoology, 2.
Italian in alternate years.	Constitutional Law and History.	Botany, 2, 3.
Semitic Languages, 2, 3.	Art (History of) and Archæology, (2 half courses in successive years),	Geology, 1.
Comparative Philology (half course), 1A, 1B	History of Philosophy, 4A, 4B.	Physiology, Anatomy — *In the Faculty of Medicine.*

From the above divisions six courses are to be selected by each student in the Third and Fourth Years, three in each year. Each will be studied in lecture courses extending over not more than four hours per week, with collateral reading, and, in the case of the science subjects, laboratory work. One subject chosen in the Third Year *must* be continued by every student in his Fourth Year; two subjects *may* be continued if application to that effect be granted by the Faculty or the Advisory Committee of the Faculty. Of the whole six courses, one must be chosen by all candidates from the list of subjects (other than Mathematics) included under the head of Science, except in cases where Chemistry or Biology has been selected as an option in the Second Year.

Every Undergraduate in the Third and Fourth Years is required to submit to the Faculty, for their approval, at the beginning of the session, a written statement of the subjects he proposes to study during the session. He will not be allowed to discontinue any of these, if approved, or begin any other, without the special permission of the Faculty.

The Advisory Committee will meet not later than Oct. 1st in each session, and report on the selections of subjects to the Faculty. It may also report on the subjects chosen by the First and Second Years.

In order to differentiate the B.A. curriculum from that laid down for the B.Sc. (Arts), candidates for B.A. are debarred from selecting more than three out of their six courses from the Science Division. Free options are allowed in all other cases (except as far as regards the selecting of at least one subject from the Science Division), subject to approval by the Faculty, or the Advisory Committee of the Faculty.

In addition to the six courses, a course of one hour a week in English Composition (3D, 4C) must be taken by every candidate for the Ordinary B.A. in the Third and Fourth Years, and also by Honour students in English.

For details of each subject, see Courses of Lectures, p. 83 *et seqq.*

A Candidate who seeks to obtain an Ordinary B.A. Degree of the First Class must fulfil the following conditions: he must not only obtain the required aggregate of marks (viz., three-fourths of the maximum), but he must also obtain First Class standing in three of his subjects, and not less than Second Class in the remainder.

Profes-sional Students.

For arrangements enabling Students in Medicine or Applied Science to take the course in Arts also, and obtain B.A., and B.Sc. (Applied Science), or M.D., in six years, see pp. 72-74 ; and for the course leading to the degrees of B. Sc. (Arts) and M.D. in six years, see p. 75.

2. Honour Courses for the Degree of B.A.

Honour Cou

Honours of First, Second, or Third Rank will be awarded to successful candidates in any Honour Course established by the Faculty, provided they have passed creditably the ordinary Examinations in all the subjects proper to their year.

No Undergraduate is permitted to attend the Honour lectures unless (*a*) he has been placed in the First Class in the subject at the preceding Sessional Examination, if there be one ; (*b*) has satisfied the Professor that he is otherwise qualified; and (c) while attending lectures makes progress satisfactory to the Professor. In case his progress is not satisfactory, he may be notified by the Faculty to discontinue attendance.

Candidates for Honours must take the Ordinary Course in the subject in which they are reading for Honours. But where the Honours Course corresponds to two ordinary subjects, candidates may, at the discretion of the department, be exempted from attendance on lectures in these ordinary subjects for a number of hours not exceeding four weekly.

Honour lectures are open to all Partial Students who can satisfy the Professor of their fitness to proceed with the work of the course. Such students will not be ranked with Undergraduates in the Examination lists.

No student is allowed to attend two Honour Courses without the special permission of the Faculty.

Third Year and B.A. Honours.

In order to qualify for an Honour course in the Third Year, a candidate must have taken a First-Class at the Ordinary Sessional Examinations in the subject in which he proposes to compete for Honours, *or* a First or Second Class in the Advanced Section of that subject; must stand higher than Third Class in not less than half of the remaining subjects, and have no failure in any subject. In addition to the Ordinary subject specified above, he is required to take a second Ordinary subject, which may be determined by the Department in which he is a candidate for Honours.

A student who has taken First or Second Rank Honours in the Third Year, and desires to be a Candidate for B.A. Honours, shall be required to take only one subject in the Ordinary Course, viz., that in which he is reading for Honours. A Candidate, however, who at the B.A. Examinations obtains Third Rank Honours, will not be allowed credit for these exemptions at the end of the Session, unless the examiners certify that his knowledge of the whole Honour Course is sufficient to justify it.

Note.—For subjects of Ordinary Courses, see pp. 83 et seqq.

The following are the departments in which Honour Courses are at present offered. Students who desire to graduate with Honours in any of them are strongly recommended to take the Advanced Sections of the Department in the First and Second Years, where such are provided.

(N.B.—The numbers which stand after the Academic years refer to the corresponding number of the Courses given on pp.

1. Classical Literature and History.

Third Year Honours. Greek, 5, 6, (p. 87).
Latin, 5, 6, (p. 91).

Fourth Year Honours. Greek, 5, 7, (p. 87).
Latin, 5, 7, (p. 91).

2. English Language and Literature.

Third Year Honours, 5, 6, (p. 99).

Fourth Year Honours, 7, 8, 9, (p. 100); or 10, 11, 12, 13, (p. 100).

3 (a). History (Session 1902-3).

Fourth Year Honours, 3, 7, 9, (p. 111).

3 (b). History and Economics.

(A). Third Year Honours, History, 2, 3, 7, (p. 110).
Economics and Political Science, 1, 6, (pp. 114 and 116).
Fourth Year Honours, History, 3, 7, 9, (p. 111).
Economics and Political Science, 2, 3, and 7 or 8, (pp. 114–117).

(B). Third Year Honours, Economics and Political Science, 1, 4, 5, 6, (pp. 114–116).
History, 2, (p. 110).
Fourth Year Honours, Economics and Political Science, 2, 3, 4, 5, 7, 8, (pp. 114–117).
History, 3, 7, (p. 111).

4. Modern Languages.

Third Year Honours, French, 7 or 8; 9, (p. 104).
German, 6 or 7; 8, (p. 107).
Fourth Year Honours, French, 7 or 8; 9, (p. 104).
German, 6 or 7; 8, (p. 107).

5. Semitic Languages.

Third Year Honours, 4*a* and 4*b*, (p. 109).
Fourth Year Honours, 5*a* and 5*b*, (p. 109).

6. Mental and Moral Philosophy.

Third Year Honours, 7, (p. 122).
Fourth Year Honours, 8, 9, (p. 122).

7. Mathematics and Natural Philosophy.

Third Year Honours, 11, 12.
Fourth Year Honours, 8, 13, 14.

8. Experimental Physics.

Third Year Honours, 7, 8, 15.
Fourth Year Honours, 16.

9. Geology and Mineralogy.

Third Year Honours, Mineralogy, 1, 3.
Fourth Year Honours, Mineralogy, 2.
Fourth Year Honours, Geology, 2, 3A, 3B, 4, 5, 6.

10. Chemistry.

Third Year Honours, 2, 3, 4.
Fourth Year Honours, 5, 6, 7, 8; or 7, 8, 9.

11. Biology.

Third Year Honours, { Botany, 4. / Zoology, 2, 3.

Fourth Year Honours, { Botany, 5. / Zoology, 4.

Students proceeding to Honours Biology in the Third and Fourth Years will take Chemistry and Biology in the Second Year, one half course of Organic Chemistry in the Third Year, and one half course of Geology in the Fourth Year.

3. Ordinary Course for the Degree of B.Sc. (Arts.)

The B.Sc. course in Arts has been specially arranged to give the student a thorough training in Science, combined with a good knowledge of English, French, and German. A wide range of sciences may be studied, and the course differs from the courses offered in the Faculty of Applied Science in the substitution of modern languages for the more purely technical work of that Faculty.

A high standard of attainment will in all cases be exacted, and it is expected that in the final year the course will include instruction in the methods of modern research.

First Year.

English and History.
French.
German.
Mathematics.
Physics, of the First Year of the ordinary B.A. Course.

Second Year.

English, of the Second Year of the B.A. Course.
French.
German.
Chemistry.
Mathematics or Elementary Biology.

(*a*) Upon entering the Second Year, the student must decide upon the general character of the course which he will follow in the Third and Fourth Years. If his course in these Years is to consist chiefly of Mathematics and Physics, he must choose Mathematics; if it is to be chiefly Biological or Geological, he must take Biology; while if he intends to select Chemistry, he must take Mathematics if he intends to devote special attention to Physical Chemistry, but Biology if he intends to make special study of other branches of this science.

(*b*) A candidate for the degree of B.Sc. must obtain at least second class standing in both French and German at the Intermediate Examination, and, upon entering the Third Year, must, in order to proceed with his course, be able to read with ease scientific papers in both of these languages.

(*c*) The student shall in the Third Year take a full course in each of three of the following sciences, viz. :—Mathematics, Physics, Chemistry, Zoology, Botany, Geology. He shall take, in addition, a portion of the B. A. Honour Course in one of them, as well as a course in English Composition.

(*d*) In the Fourth Year the student shall devote his time chiefly to advanced work in one of the three sciences which he has already studied in the Third Year. The course which he is to follow will be drawn up by the Professors of the science which he selects and must be approved by the B.Sc. Advisory committee.

IV. Examinations.

(A) College Examinations.

1. There are two examinations in each year, viz., at Christmas and at the end of the Session. Successful students are arranged in three classes at the Sessional examinations.

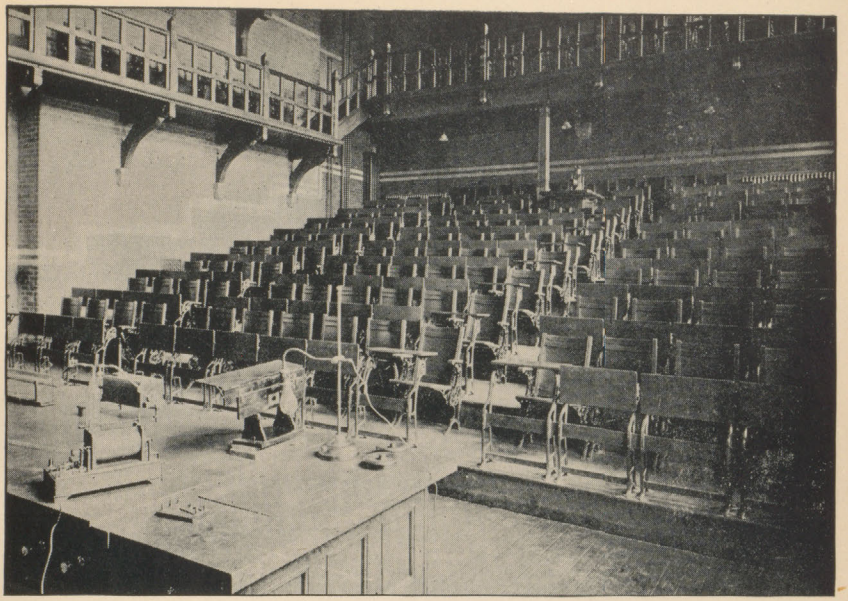
Christmas Examinations will be held in all the subjects of the First and Second Years, and are obligatory on all Undergraduates, and also on all Partial Students intending to gain undergraduate standing. Twenty-five per cent. of the marks given for the sessional work in each subject will be assigned for the results of the Christmas Examinations. Candidates who fail in courses of the First and Second Years, terminating at Christmas, will be required to pass at the Sessional Examinations on an extra paper in the subject in which they have failed.

Christmas Examinations in the Third or Fourth Years may be held at the option of the Professors. When held, the same value will be assigned to them as in the case of the First and Second Years.

In the Fourth Year only, there is no Sessional Examination ; the University Examination for B.A. or B.Sc. takes its place.

2. Undergraduates who fail in one subject at the Sessional Examinations of the First or of the Second Year are required to pass a Supplemental Examination therein the following September. Should they fail in this Examination, they must in the following Session attend the Lectures and pass the Examination in the same subject, in addition to the regular course, or pass the Examination only, without attending Lectures, at the discretion of the Faculty.

3. Failure in two or more subjects at the Sessional Examinations of the First or of the Second Year, or in one subject at the Third Year Sessional Examinations, involves the loss of the Session. The Faculty may permit the student



Macdonald Physics Building.—A Lecture Theatre.



Macdonald Physics Building.—An Elementary Electrical Laboratory.

to recover his standing by passing a Supplemental Examination at the beginning of the following Session.

4. Examinations Supplemental to the Sessional Examinations will be held in September, simultaneously with the Matriculation Examinations.

5. A list of those to whom the Faculty may grant Supplemental Examinations in the following September will be published after the Sessional examination. The time for the Supplemental Examination will be fixed by the Faculty; the examination will not be granted at any other time, except by special permission of the Faculty, and on payment of a fee of $5.

(B) University Examinations.

For the Degree of B.A.

After passing the Matriculation Examination at entrance, candidates for the Degree of Bachelor of Arts must pass each of the four Sessional Examinations, including the Intermediate Examination at the end of the Second Year. Under the provisions of the new curriculum, the Third and Fourth Year Sessional Examinations constitute the Final.

1. Matriculation Examination.

1. The subjects are stated on pp. 13-20.

2. Intermediate Examination.

2. The subjects are as follows :—

(a) **English ;**
(b) **Greek** *or* **Latin ;**
(c) **Latin** *or* **Greek** *or* **a Modern Language.**
(d) **Mathematics, including Dynamics,** *or* **Elementary Biology.**
(e) **Chemistry.**
(f) **Logic and Psychology.**
(g) **Hebrew.**
(h) **German** *or* **French.**

Any Three of which (d), (e), or (g), must be one

English.—The course for the Second Year. See p. 95.

Greek.—The course for the Second Year. See p. 84.

A paper will be set early in October on the Summer Readings, Lucian, Charon and Somnium (Heitland, Pitt Press.) *See p.* 84.

Latin.—The course for the Second Year. See p. 89.

A paper will be set early in October on the Summer Readings, Quintilian, X, c. I. *See p.* 89.

Mathematics.—The course for the Second Year. See p. 126.

Dynamics.—The course for the Second Year. See p. 126

Chemistry.—The course for the Second Year. See p. 130.

Logic and Psychology.—The course for the Second Year. See pp. 119 and 120.

Hebrew.—The course for the Second Year. See p. 109.

3. Final Examination.

The qualifying subjects for the B.A. Degree will, under the New Curriculum, consist of the six subjects taken up in course in the Third and Fourth Years (pp. 63 and 64).

V. Regulations for Courses in Arts Leading into the Professional Faculties.

Arts and Applied Science.

1. Any student intending to claim the privileges offered below, is required, at the beginning of the session, to present to the Dean of the Faculty of Arts a certificate of registration in the Professional Faculty, and to produce at the end certificates of attendance and examination in the professional classes specified.

2. Undergraduates beginning the Third Year in Arts who have taken all the Ordinary Mathematics of the first two years, and the Chemistry of the Second Year, and who wish to pursue their professional studies in the Faculty of Applied Science so as to obtain the Degree of B.A. and B.Sc. (App. Sc.) within the following four years, may be exempted by the Faculty of Applied Science from the Mathematics of the First Year in Applied Science and from Chemistry of the Second Year.

3. They are allowed to distribute the course of the Third and Fourth Years in Arts over three years.

4. They may complete the Arts curriculum by taking the following courses :—

I. *In the Third Year* :—

(*a*) Physics of Third Year.

(*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.*

II. *In the Fourth Year* :—

(*a*) Physics of Fourth Year.

(*b*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.

(*d*) The Mathematics of the Second Year Applied Science (6 hours weekly as 1½ courses).

III. *In the Fifth Year* :—

The Mathematics of the Third Year Applied Science (2 hours weekly as a half course), or another course under the heading "Science" in the Arts curriculum.

*Note.—Students are recommended to distribute their English work over two years.

Arts (B.A. Course) and Medicine.

1. Undergraduates beginning the Third Year, who have taken the Chemistry and Biology of the Second Year, and who wish to pursue their professional studies in the Faculty of Medicine so as to obtain the Degrees of B.A. and M.D. within the following four years, may be exempted by the Faculty of Medicine from the subjects of Chemistry and Physics, and Biology in the First Year of the Faculty of Medicine.

2. They may complete the Arts curriculum by taking the following courses :—

I. *In the Third Year* :—

(*a*) Anatomy and Practical Anatomy, Histology and Physiology, of First Year Medicine.

(*c*) Either one or two of the courses which are not placed under the heading " Science " in the Arts curriculum.

(*c*) Either one of two hours weekly in English Composition.*

II. *In the Fourth Year* :—

(*a*) Anatomy and Practical Anatomy, Histology, Physiology, Chemistry, of Second Year Medicine.

(*b*) One of the courses which are not placed under the heading " Science " if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.*

3. The Faculty strongly recommends intending students of Medicine who do not take the combined six years' course to spend a preliminary year in the study of the non-professional subjects, *i.e.*, Biology, Chemistry, and Physics, before entering on the curriculum in the Faculty of Medicine.

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*Note.—Students are recommended to distribute their English work over two years.

Arts (B.Sc. Course) and Medicine.

1. Students who wish to take a combined course in the Faculties of Arts and Medicine with a view to obtaining the Degrees of B.Sc. (Arts) and M.D. within six years, must take Latin under head 5 of the Matriculation requirements for the B.Sc. course, see p. 13.

2. They must take the Ordinary B.Sc. course with the following modifications :—

Second Year Students shall take Elementary Biology. This course shall consist of either (I) the course in Elementary Biology required of First Year Students in Medicine (*i.e.,* 8 weeks Zoology together with 4 weeks Botany), together with a further course after Christmas (during the spring term of the Faculty of Arts) in Animal Biology; *or* (II) the full ordinary course in Elementary Biology of the Faculty of Arts, consisting of 12 weeks Zoology (up to Christmas) followed by 12 weeks Botany.

Third Year Students taking the Double Course shall be required to offer one of the following:—

I. Zoology.—(*a*) The full Ordinary Continuation Course of the Faculty of Arts, and in addition (*b*) half the Honours Course, the latter to be taken during the first half of the session.

II. Physics.—(*a*) The Full Ordinary Course of the Faculty of Arts, under which head students may take either the course in Sound, Light and Heat (Physics,7) or that on Electricity and Magnetism (Physics, 8), or a combined course consisting of portions of these, and in addition (*b*) advanced work constituting half an Honours Course, the latter to be taken during the first half of the session.

III. Chemistry.—(*a*) A half-course in Physical Chemistry, during the first half of the session (from Chemistry, 7, 8); (*b*) a half-course in Organic Chemistry, during the second half of the session (Chemistry, 3, 6); (*c*) advanced work constituting half an Honours Course, the last to be taken during the first half of the session.

IV. Botany.—(*a*) The full Ordinary Primary Course of the Faculty of Arts (Botany, 2); (*b*) *either* half the Honours Course prescribed for Fourth Year Students in the Faculty of Arts (Botany, 5); *or* half an Honours Course in Chemistry, Physics or Zoology. The work under (*b*) is in any case to be taken during the first half of the session.

Fourth Year.—Wednesday afternoon and Saturday morning of each week shall be devoted either (I) to Laboratory Work in connection with still more advanced study in the subjects selected during the Third Year; *or* (II) to work in another branch of Science, provided the student is sufficiently well grounded to enable him to do the special work which may be assigned to him.

Arts and Law.

Students intending to go forward to the Faculty of Law are recommended to include in their Third and Fourth Years Arts, such subjects as Constitutional Law and History, Economics, Political Science, and Roman Law.

Literate in Arts.

A certificate of "Literate in Arts" will be given along with the professional degree in Medicine or Applied Science, to those who have completed two years' study in the Faculty of Arts, and have passed the prescribed examinations.

Students of the University Attending Affiliated Theological Colleges.

Affiliated Theological Colleges.

1. These students are subject to the regulations of the Faculty of Arts in the same manner as other students.

2. The Faculty will make formal reports to the governing body of the Theological College which such students may attend as to :—(1) their conduct and attendance on the classes of the Faculty; and (2) their standing in the several examinations; such reports to be furnished after the Examinations, if called for.

3. Students of affiliated Theological Colleges who are pursuing a double course in Arts and Divinity (six years at least) will take in the Third and Fourth Years the courses which constitute the ordinary curriculum in Arts, less a half course in each of these Years, or a whole course in either.

VI. Medals, Prizes, Classing, and Certificates.

1. **Gold Medals** will be awarded in the B.A. Honour Examinations to Students who take the highest Honours of the First Rank in the subjects stated below, and who shall have passed creditably the Ordinary Examinations for the Degree of B.A., provided they have been recommended therefor to the Corporation by the Faculty on the report of the Examiners :—

The Henry Chapman Gold Medal for Classical Languages and Literature.

The Prince of Wales Gold Medal for Mental and Moral Philosophy.

The Anne Molson Gold Medal for Mathematics and Natural Philosophy.

The Shakspere Gold Medal for the English Language and Literature.

The Logan Gold Medal for Geology, Mineralogy and Palæontology.

The Major Hiram Mills Gold Medal for Biology.

In addition to the above, certain medals are offered annually by the Alliance Française, at the discretion of the Deparment of Modern Languages.

If there be no candidate for any Medal, or if none of the candidates fulfil the required conditions, the Medal will be withheld, and the proceeds of its endowment for the year may be devoted to prizes in the subject for which the Medal was intended. For details, see announcement of the several subjects below.

2. **Special Certificates** will be given to those Candidates for B.A. who have been placed in the First Class at the ordinary

B.A. Examination; have obtained three-fourths of the maximum marks in the aggregate of the six courses proper to the Third and Fourth Years, are in the First Class in not less than half of these courses, and have no Third Class. At this examination, no Candidate who has taken exemptions (see pp. 72-77) can be placed in the First Class unless he has obtained First Class in four of the departments in which he has been examined, and has no Third Class.

3. Certificates of High General Standing will be granted to those Undergraduates of the first two years who have obtained three-fourths of the maximum marks in the aggregate of the studies proper to their year, are placed in the First Class in not less than half the subjects, and have not more than one Third Class.

4. Prizes or Certificates will be given to those Undergraduates who have distinguished themselves in the studies of a particular class, and have attended all the other classes proper to their year.

5. Graduates who attend lectures in any subject, and pass the corresponding Examinations therein, may obtain certificates of their standing, whether the course in question be Ordinary, Advanced or Honour.

6. His Excellency the Earl of Minto has been pleased to offer annually during his term of office a Gold Medal for the study of Modern Languages and Literature.

The Regulations for the Gold Medal are as follows:—

(1) The subjects for competition shall be the French and German languages and literatures.

(2) The course of study shall extend over two years, viz., the Third and Fourth Years.

(3) The successful Candidate must be capable of speaking and writing both languages correctly.

(4) There shall be examinations in the subjects of the course in both the Third and Fourth Years, at which Honours may be awarded to deserving Candidates.

(5) The general conditions of competition and the privileges as regards exemptions shall be the same as for the other Gold Medals in the Faculty of Arts.

(6) Students from other Faculties shall be allowed to compete, provided they pass the examinations of the Third and Fourth Years in the above subjects.

(7) Candidates desiring to enter the Third Year of the Course, who have not obtained first-class standing at the Intermediate or Sessional Examinations of the Second Year in Arts, are required to pass an examination in the work of the first two years of the Course in Modern Languages, if called on to do so by the Professors.
(8) The subjects of examination shall be those of the Honour Course in Modern Languages.

6. The Neil Stewart Prize of $15 open to all Undergraduates and Graduates of this University, and also to Graduates of any other University, who are students of Theology in some College affiliated to this University. The rules which govern the award of this prize are as follows:—

(1) The Candidate must pass, in the First Class, a thorough examination upon the following subjects: Hebrew Grammar; reading and translation at sight from the Pentateuch, and from such poetic portions of the Scriptures as may be determined.
(2) There will be two Examinations of three hours each—one in Grammar and the other in Translation and Analysis.
(Course for the present year: Hebrew Grammar (Gesenius; Translation and Analysis of Exodus; Isaiah XL. to the end of the book.)
(3) In case competitors should fail to attain the above standard, the prize will be withheld, and a prize of $30 will be offered in the following year for the same.

This Prize, founded by the late Rev. C. C. Stewart, M.A., and terminated by his death, was re-established by the liberality of the late Neil Stewart, Esq., of Yankleek Hill.

7. Early English Text Society's Prize.—This prize, the annual gift of the Early English Text Society, will be awarded for proficiency in the subjects of the language group in the English Honour curriculum of the Third and Fourth Years.

8. New Shakspere Society's Prize.—This Prize, the annual gift of the New Shakspere Society, open to Graduates and Undergraduates, will be awarded for a critical knowledge of the following plays of Shakspere :—Hamlet ; Macbeth ; Othello ; King Lear.

9. Charles G. Coster Memorial Prize.—This Prize, intended as a tribute to the memory of the late Rev. Chas. G. Coster, M.A., Ph.D., Principal of the Grammar School, St. John, N.B., is offered by Colin H. Livingstone, B.A., to Undergraduates (men or women) from the Maritime Provinces, Nova Scotia, New Brunswick and Prince Edward Island.

In April, 1903, it will be awarded to that Undergraduate of the First, Second or Third Year, from the above Provinces, who, in the opinion of the Faculty, has passed the most satisfactory Sessional Examinations, under certain conditions laid down by the donor.

10. Annie McIntosh Prize.—The income of the sum of $425, subscribed by the pupils and friends of the late Miss Annie M. McIntosh, will be offered as a prize to students of the Royal Victoria College in such subject or for such work as the Faculty may determine.

11. Science Scholarships Granted by Her Majesty's Commission for the Exhibition of 1851.—These scholarships of the value of £150 a year are tenable for two or, in rare instances, three years. They are limited, according to the Report of the Commission, "to those branches of Science (such as Physics, Mechanics and Chemistry) the extension of which is specially important for our national industries." Their object is not to facilitate ordinary collegiate studies, but "to enable students to continue the prosecution of science with the view of aiding in its advance or in its application to the industries of the country."

Six nominations to these scholarships have already been placed by the Commissioners (in 1891, 1893, 1895, 1897, 1899 and 1901), at the disposal of McGill University, and have been awarded.

When nominations are offered, they are open to Students of not less than three years standing in the Faculty of Arts or of Applied Science, and are tenable at any University or at any other Institution approved by the Commission.

12. The names of those who have taken Honours, Certificates or Prizes will be published in order of merit, with mention, in the case of Students of the First and Second Years, of the schools in which their preliminary education has been received.

VII. Summer Classes.

During the months of May and June, a series of Summer Classes will be conducted, intended mainly in the first instance, to meet the requirements of students in the first two years of their course. The subjects offered are English, Latin, Greek, Mathematics, Logic, French and German. A fee of eight dollars will be exigible for any one class, and of four dollars for each additional class.

VIII. Fees.

All fees and fines are payable to the Bursar.

The sessional fees are due on the first day of attendance on lectures. They must be paid to the Bursar, and the receipts shown to the Dean within a fortnight after the commencement of attendance in each session. In case of default, the student's name will be removed from the College Books, and can be replaced thereon only by permission of the Faculty, and on payment of a fine of $2.

Undergraduates matriculated before May, 1898, and Partial Students who have entered the affiliated Theological Colges before May, 1898, and are pursuing the curricula of such Colleges, are subject to the old scale of fees.

1. Undergraduates and Conditioned Students.—$61 per session. This will include the fee for Laboratory work, Library, Gymnasium and Athletics, and Graduation. In the Third and Fourth Years, it will cover the normal amount of practical instruction given in each subject having a Laboratory Course.

Matriculation fee for entrance into the Second Year, $10, in addition to the sessional fee.

2. Partial Students.—(First and Second Years.)—$16 per session for one course of lectures, including the use of the Library; $12 per session for each additional course; $8 per session for each half-course. In addition there will be a fee of $3 for Athletics.

3. Partial Students.—(Third and Fourth Years.)—$22 per session for one course of lectures, including the use of the Library; $20 per session for each additional course; $11 per session for each half-course. In addition there will be a fee of $3 for Athletics.

The lectures (and laboratory work, if any) in one subject in any one of the four College years constitute a "Course," if occupying three hours per week, a "Half-Course" if occupying less than three hours per week.

Partial Students taking the full curriculum in any one year pay the same fees as Undergraduates in that year.

4. Caution Money.—Every student is required to deposit with the Bursar the sum of $5 as caution money for damage done to furniture, apparatus, books, etc.

5. Graduates in Arts of this University are allowed, on payment of one-half of the usual fees, to attend all lectures, except those for which a special fee is exigible. For Bachelors of Arts proceeding to M.A. by taking for one year a graduate course of study, the fee is $40. This will cover Laboratory work.

6. Higher Degrees.—The fees for the degrees of M.A., M.Sc., D.C.L., LL.D. (Old Regulations), D.Lit., D.Sc. (for particulars see pp. 24-28) must be sent with the thesis to the Secretary of the University. This is a condition essential to the reception of the application. The Secretary will then forward the thesis to the Dean of the Faculty. If no thesis be required, the fees must be paid bfore the Examination.

7. Special Fees.—

Elocution (optional)	5 00
Gymnasium (for partial students)	2 50
Supplemental Examination, at the regular date fixed by the Faculty	2 00
Supplemental Examination, when granted at any other time than the regular date fixed by the Faculty	5 00

CERTIFICATE OF STANDING, if granted to a student on application.. .. .. 1 00

CERTIFICATE OF STANDING, if accompanied by a statement of classification in the several subjects of examination.. .. .. 2 00

All applications for certificates must be addressed to the Registrar of the University, accompanied by the required fee.

No certificates are given for attendance on lectures unless the corresponding examinations have been passed.

All fees for Supplemental Examinations must be paid to the Bursar, and the receipts shown to the Dean before the examination.

All fines are applied to the purchase of books for the Library.

IX. COURSES OF LECTURES.

Classical Literature and History.

PROFESSORS:—W. PETERSON, M.A., LL.D.
FRANK CARTER, M.A.
ASSOCIATE PROFESSOR:—A. J. EATON, M.A., PH.D.

LECTURERS:—{ S. B. SLACK, M.A.;

In this department, the work of the first two years is divided mainly between exercise in Grammar and Composition and the reading of selected authors. The attention of the student is at the same time directed to the collateral subjects of History, Literature, Antiquities, and Geography, in connection with which various text-books are recommended, as specified below.

In the Third and Fourth Years (as also in the Honour Courses) the instruction takes more of the lecture form, and an attempt is made to give a connected view of the leading branches of ancient literature, and the most important phases of ancient life and thought.

Students may be examined on the whole of the work prescribed for each class, even though it may not have been overtaken in lecture.

Subjects are suggested for Summer Readings in the various branches of class work. Students are strongly recommended to undertake these subjects during their long vacation, and credit will be given for them at an examination held in the first week in October.

Students are also recommended to devote some part of the vacation to the subjects set down under the head of History and Literature, which will form part of the Sessional Examination.

Greek.

Ordinary First Year.

1. In this class, besides a review of grammatical principles (Rutherford's Greek Grammar, Accidence), portions of some Greek authors—*e.g.*, Xenophon, Homer, Herodotus, Lucian, and Euripides—are read and explained.

For 1902-3, the work will be Xenophon, The Story of Cyrus (Gleason, American Book Co.); Homer, Odyssey I. (Marchant, Bell & Co.); Euripides, Heracleidae (Beck and Headlam, Cambridge Press). For *Composition*, the manual used will be North & Hillard's Greek Prose Composition (Rivingtons); for *Translation at Sight*, written and oral, Turner's Latin and Greek Passages (Longmans).

History.—From B.C. 560 to 479, Cox's "Greeks and Persians" (Longmans' Epoch Series).

Four hours a week.

Second Year.

2. The work of the Second Year will be selected mainly from the Greek Dramatists, and from Thucydides, Plato or Demosthenes.

Subjects for 1902-03:—

Summer Readings.—Lucian's Charon and Somnium (Heitland, Pitt Press). Students are also recommended to work through some portion of Burnet's Greek Rudiments (Longmans).

Sessional Lectures.—Thucydides, The Siege of Plataea (Sing, Rivingtons), and The Retreat from Syracuse (Rouse, Rivingtons); Homer, Odyssey X (Edwards, Pitt Press); Sophocles, Ajax (Jebb, Longmans, or Campbell & Abbott,



Macdonald Chemistry and Mining Building.

Clarendon Press). The practice of *Composition and Translation at Sight* will be continued as before; North & Hillard's Greek Prose Composition (Rivingtons); and Jerram's Anglice Reddenda (First Series).

History.—The Athenian Supremacy; Cox's "Athenian Empire" (Longmans' Epoch Series), with Abbott's "Pericles" (Putnam).

Literature.—Outlines as contained in Jebb's Primer of Greek Literature, pp. 1-100.

Four hours a week.

The following books are recommended for general use during the first two years of the course:—Jebb's Introduction to Homer (Maclehose); Jebb's Primer of Greek Literature, supplemented by readings in Murray, Jevons or Mahaffy; Gow's Companion to School Classics (in part); Oman's History of Greece (Longmans), or Bury's (Macmillan); Mahaffy's Primer of Greek Antiquities; and Tozer's Primer of Classical Geography (Macmillan); Rutherford's Greek Grammar (Accidence and Syntax); or Sonnenschein's (Parallel Grammar Series), or Burnet's Greek Rudiments.

Students should provide themselves also with Kiepert's Atlas Antiquus.

Third Year.

3. Under the provisions of the new curriculum Greek is one of the subjects which may be offered as one of the six courses during the Third and Fourth Years together. The increased time which will thus be given to it will make it possible to add to the reading of selected authors and the practice of Composition and Translation at Sight short courses of lectures on subjects of general interest in the departments of History, Philosophy, Literature, Art and Antiquities. One-fourth of the whole time of the Class (*i.e.*, one hour a week) will be devoted to such lecture courses.

For the Session 1902-03, the course will be as follows:—

a. Summer Readings.—Sophocles, Antigone (Jebb, Pitt Press, or Campbell & Abbott, Clarendon Press).

b. History, Literature, Art and Antiquities.—Courses will be delivered on two of the following three:—

(1) Greek Constitutional History—12 Lectures.

(2) An outline sketch of Greek Poetry—12 Lectures.

(3) History of Greece from the accession of Alexander the Great—12 Lectures.

These lectures will be illustrated, where possible, by lantern slides or photographs, while many of the best works on classical antiquities will also be accessible to the student in the College Library.

c. Authors.—Kynaston's Greek Elegiac Poetry (Macmillan); Aeschylus, Prometheus Vinctus (Rackham, Pitt Press); Demosthenes, De Pace, Philippic II, Chersonesus, Philippic III. (Sandys, Macmillan).

d. For practice in *Composition*, Sidgwick's Introduction to Greek Prose will be used; for *Translation at Sight*, Tod and Longworth, Passages for Unseen Translation (Longmans).

Four hours a week.

Fourth Year.

4. Subjects for 1902-03:—

Summer Readings.—Merriam's "The Phaeacians of Homer" (Harpers). (containing Odyssey VI., VII., VIII. and XIII., 1-184).

The remainder of the course will be the same as for the Third Year.

The following books are recommended for general use: Gow's Companion to School Classics (Macmillan); Bury's History of Greece (Macmillan); Jebb's Growth and Influence of Classical Greek Poetry (Macmillan); Campbell's Guide to Greek Tragedy (Percival); Abbott's Pericles (Putnam); Haigh's The Attic Theatre (Clarendon Press); Cornish's Concise Dictionary of Greek and Roman Antiquities (Murray); Jevons' or Mahaffy's or Murray's History of Greek Literature; Kiepert's Manual of Ancient Geography (Macmillan); Greenidge's Constitutional History; King & Cookson's Comparative Grammar (Clarendon Press).

Students taking Comparative Philology as a half course in either the Third or Fourth Year may in that year omit from the prescribed courses in Greek, or Latin, or Greek and Latin together, one author and two of the short courses under the head of History, Literature, Art and Antiquities.

Honours Third and Fourth Years.

5. The work of the Honours Classes in Greek has been so arranged as to admit of separate courses of lectures being given, with illustrative readings, along certain main lines of literary study, in addition to supplementary work as provided for below. In 1902-1903 the Lecture courses will be as under, the books selected for class reading being specified under each separate head:—

A. Lyric Poetry : Pindar, Selections (Seymour, Ginn & Co.).

B. Philosophy : Forman's Selections from Plato (in part) (Macmillan).

C. Oratory : Denosthenes, contra Midiam (J. R. King, Clarendon Press).

Three hours a week.

Translation at Sight.—Fox & Bromley's Models and Exercises (Clarendon Press).

Prose Composition.—Sidgwick, and from Dictation.

Seminary Work.—Essays and Lectures on History, Literature, Comparative Philology and Ancient Philosophy.,

Third Year.

6. *Private Reading.*—Plato, Purves's Selections, pp. 1-21, and 55 to 112 (Clarendon Press); Thucydides VI (Marchant, Macmillan); Sophocles, Antigone (Jebb, Pitt Press ; or Campbell & Abbot, Clarendon Press).

In *History* the examination will be directed to testing a general knowledge of the course of Greek History to the death of Alexander, and a more minute knowledge of the development of the Athenian Constitution and the period of Athenian Suprenacy. In *Literature*, a general knowledge will be expected of the course of Greek literature and a more minute knowledge of the lives and writings of the authors prescribed.

Fourth Year.

7. *Private Reading.*—Sophocles, Trachiniae (Jebb, Cambridge Press); Herodotus, Book VII (Butler, Macmillan); Aristophanes, Frogs (Merry, Clarendon Press); Attic Orators (Jebb's Selections, Macmillan); Aristotle, Ethics, I, II, and X (Bywater, Oxford); Theocritus, I, II, IV, XI, XV (Kynaston, Clarendon Press).

History, Literature and Antiquities.—Oman, Bury, Symonds, Murray; Jebb's Growth and Influence of Classical Greek Poetry; Leaf's Companion to the Iliad; Butcher's Aspects of the Greek Genius; Mahaffy's Social Life in Greece; Jebb's Attic Orators.

Grammar and Philology.—Goodwin's Greek Moods and Tenses, and Giles's Short Manual of Philology (Macmillan); Monro's Homeric Grammar (Clarendon Press).

British School of Classical Studies at Athens.

This University is a contributor to the support of this School, which affords facilities for archæological and classical investigation, and study in Greece. Graduates in Arts of McGill University are accordingly entitled to special privileges and advantages as regards tuition in the School.

Latin.

Ordinary. First Year.

1. In this class, besides a general review of grammatical principles (Sonnenschein's Latin Grammar; Parallel Grammar Series), portions of some Latin author,—such as Ovid, Tibullus, Livy, Sallust, Virgil, Horace or Cicero—are read and explained.

For 1902-03, the subjects will be Kirtland's Selections from the Correspondence of Cicero (in part), (American Book Co.); Ovid, Elegiac Selections (F. C. Smith, Bell & Co.); Sallust, Catiline (Summers, Pitt Press). For practice in *Composition*, both written and oral, the text-book in use during the first two years will be North and Hillard's Latin Prose Composition (Rivington's); and for *Translation at Sight*, Turner's Latin and Greek Passages (Long-

mans). *History.*—Carthaginian Wars, B.C., 263-146; Shuckburgh's History of Rome, or "Rome and Carthage" (Longmans' Epoch Series).

Four hours a week.

2. For 1902-03, the subjects will be:— **Second Year.**

Summer Readings.—Quintilian, X, c. 1, being Quintilian's review of Ancient Literature (Peterson, Clarendon Press, smaller edition).

Students are also recommended to continue the practice of Prose Composition (North and Hillard).

Sessional Lectures.—Livy, Book II (Conway, Pitt Press); Horace, Wickham's Selected Odes (Clarendon Press); Virgil, Aeneid VII, VIII (Sidgwick, Pitt Press). *Composition and Translation at Sight,* North & Hillard's Latin Prose Composition (Rivingtons); and Ritchie's Easy Passages (Longmans).

History.—The last Century of the Republic, B.C. 133-31; as in Beesly's "The Gracchi, Marius and Sulla" (Longmans' Epoch Series), and "The Roman Triumvirates" (Merivale, Longmans' Epoch Series).

Literature.—The subject matter of Quintilian X, chap. 1, §§ 37-131.

Four hours a week.

The following books are recommended for general use during the first two years of the course: How and Leigh's History of Rome (Longmans); Strachan-Davidson's Cicero; Warde-Fowler's Cæsar (Putnam); Wilkins' Primer of Roman Literature; Wilkins' Primer of Roman Antiquities; Latin Grammar, Gildersleeve and Lodge.

Students should provide themselves also with Kiepert's Atlas Antiquus.

3. Under the provisions of the new curriculum, Latin is one of the subjects which may be offered as one of six courses, during the Third and Fourth years together. The increased time which will thus be given to it will make it possible to add to the reading of selected authors and the **Third Year.**

practice of Composition and Translation at Sight short courses of lectures on subjects of general interest in the departments of History, Philosophy, Literature, Art and Antiquities. One-fourth of the whole time of the Class (*i.e.*, one hour a week) will be devoted to such lecture-courses.

For the Session 1902-03, the course will be as follows:—

a. Summer Readings.—Virgil, Aeneid VI (Sidgwick, Pitt Press).

b. History, Literature and Antiquities.—Courses will be delivered on at least two of the following three subjects:—

(1) Roman Drama—12 Lectures.
(2) The Last Century of the Republic—12 Lectures.
(3) History of Roman Literature to the end of the Republic—12 Lectures.

These lectures will be illustrated, where possible, by lantern slides or photographs, while many of the best works on classical antiquities will also be accessible to the student in the College Library.

c. Authors.—Tacitus, Histories I (Davies, Pitt Press); Lucretius V (Duff, Pitt Press); Pliny's Letters, in part (Westcott, Ginn & Co.).

d. *For* practice in *Composition*, Sargent's Easy Latin Prose Exercises (Clarendon Press), and from dictation; and for *Translation at Sight*, Tod and Longworth, Passages for Unseen Translation (Longmans).

Four hours a week.

Fourth Year.

4. Subjects for 1902-03:—

Summer Readings.—Horace, De Arte Poetica (Wilkins, Macmillan).

The remainder of the course will be the same as for the Third Year.

Note.—The following books are recommended for general use: Gow's Companion to School Classics (Macmillan);

Mackail's Latin Literature (Murray); How & Leigh's History of Rome (Longmans); Pelham's Outlines of Roman History (Percival); Capes' Early Roman Empire (Longmans' Epoch Series); Cornish's Concise Dictionary of Greek and Roman Antiquities (Murray); Kiepert's Manual of Ancient Geography (Macmillan); Bennett's Appendix to Latin Grammar.

Students taking Comparative Philology as a half course in either the Third or Fourth Year may in that year omit from the prescribed courses in Latin, or Greek, or Latin and Greek together, one author and two of the short courses under the head of History, Literature, Art and Antiquities.

Honours. Third and Fourth Years.

5. As in Greek, the work of the Honours Classes in Latin has been so arranged as to admit of separate courses of lectures being given, with illustrative readings, along certain main lines of literary study, in addition to supplementary work as provided for below. In 1902-1903, the Lecture Courses will be as under, the books selected for class reading being specified under each separate head:—

A. Epic Poetry: Virgil, Aeneid, X, XI, XII (Sidgwick, Pitt Press); Lucan, Pharsalia, VII (Postgate, Pitt Press).

B. Oratory: Cicero, Verrine Orations (in part); for the Fourth Verrine, the edition by Hall (Macmillan) is recommended.

C. Comedy: Plautus, Captivi (Lindsay, Clarendon Press), and Rudens (Sonnenschein, Clarendon Press, smaller edition); Terence, Phormio (Sloman, Clarendon Press) and Andria (Fairclough, Allyn & Bacon).

Three hours a week.

Translation at Sight.—Fox & Bromley's Models and Exercises (Clarendon Press). *Prose Composition.*—Selected passages.

Seminary Work.—Essays and Lectures on History, Literature, Comparative Philology and Ancient Philosophy.

Third Year.

6. *Private Reading.*—Horace, Epistles I (Wilkins, Macmillan); Cicero, Pro Plancio (Auden, Macmillan); Virgil, Aeneid VI (Sidgwick, Pitt Press); Sallust, Catiline (Cook, Macmillan).

History.—A general knowledge of Roman History to the end of the first Century A.D., and a more minute knowledge of the period from B.C. 146 to the Death of Augustus.

Literature.—A general knowledge will be expected of the course of Roman Literature, and a more minute knowledge of the lives and writings of the authors prescribed.

Fourth Year.

7. *Private Reading.*—Plautus (Trinummus, Gray, Pitt Press); Livy II (Conway, Pitt Press); Cicero, Tusculan Disputations I, II, and Pro Cluentio (Peterson Macmillan); Merry's Fragments of Early Latin Poetry (Clarendon Press); Quintilian, Book X (Peterson, Clarendon Press).

History, Literature and Antiquities.—How & Leigh's History of Rome (Longmans); Tyrrel's Latin Poetry; Students' Companion to Latin Authors (Middleton & Mills, Macmillan).

Grammar and Philosophy.—Lindsay's Short Historical Latin Grammar (Clarendon Press) and Giles's Short Manual of Philology (Macmillan); Lindsay's Textual Emendation (Macmillan).

British School of Classical Studies at Rome.

The University has become a contributor to the support of this School, which has been recently instituted, and the same advantages will be enjoyed by members of the University as are offered in connection with the School at Athens (p. 88). The publications of both Societies are available in the University Library.

Sanskrit.

LECTURER:—

The two courses in Sanskrt are primarily intended for students who have passed the Intermediate examination, but permission may in certain other cases be obtained to attend the elementary course.

1. A. For beginners, the work mainly consisting in the mastering of the elements of Sanskrit Grammar with such composition as tends to fix in the mind the knowledge thus acquired. Etymological references will be frequently made and comparisons suggested in order at once to familiarize the language and give it an educational value in spite of the elementary nature of the course. This course counts as a half-course qualifying for the degree, and it is especially recommended to students attending the half-course in Comparative Philology.

Two hours a week.

1. B. For those students who have already passed through Course A or its equivalent in Sanskrit preparation; one hour per week is devoted to Lectures on Indian Literature, commencing (1902-3) with the Post Vedic Period. Two hours are devoted to reading selections; one hour to grammar and composition bearing especially on the texts read. Course B counts as one full course to the Final; courses A and B together, one and one-half, the student taking up Course B not being debarred thereby from repeating a course in another department.

Four hours a week.

Books required: Perry, Sanskrit Primer; Whitney's Sanskrit Grammar; Lanman's Sanskrit Reader (Ginn & Co.). For reference: Sanskrit Literature, A. A. Macdonell (Heinemann).

Summer Readings.—A course of Summer Readings will be suggested according to individual needs. During the months of May and June the lecturer will be glad to give his personal supervision to students of Sanskrit and is prepared to give lectures if due notice is given.

Comparative Philology.

LECTURERS :— { DR. EATON / MR. SLACK.

1. A.—INTRODUCTORY COURSE.—25 Lectures.

This course will deal with the following subjects: the history of the Science of Comparative Philology; the Indo-

Germanic languages and their classification and relation to one another; the origin of the so-called Aryan people and their primitive home and culture; the nature of compounds; the phenomenon of Ablaut and its importance in explaining apparent irregularities of declension and conjugation; the existence of external Sandhi in the Indo-Germanic languages; and the influence of Analogy and Contamination in the formation of words. The lectures will then go on to consider the Phonology of the Indo-Germanic languages in detail.

1. B.—Comparative Grammar of Greek and Latin.—25 Lectures.

This course will deal more exclusively with the history and structure of these languages and their relation to the other members of the group.

It is primarily intended for Honour Students in the Classics, and for such others as may be found to be qualified.

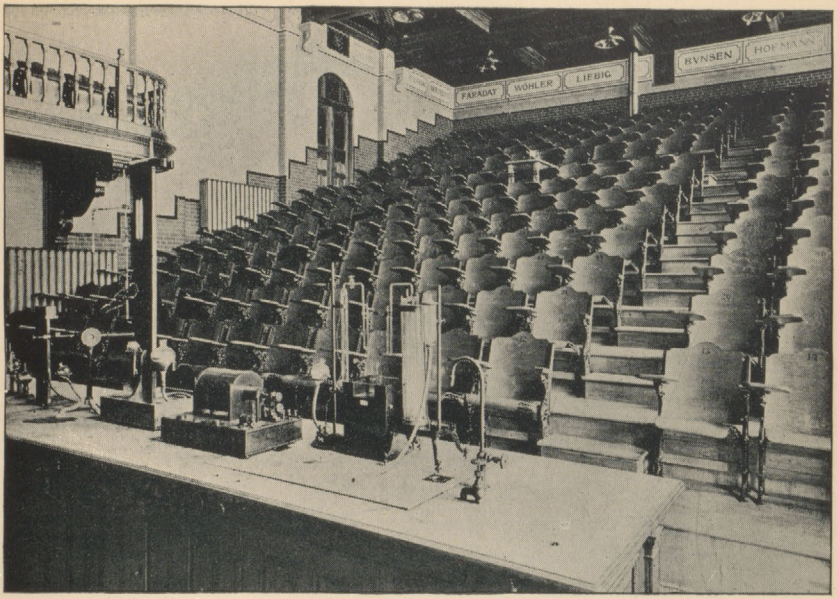
Certain exemptions in the Classical Courses are allowed to students taking the lectures in Comparative Philology, enabling them to make a full course by combining it with either Greek or Latin, or two full courses by combining it with both. see p. 91.

English Language and Literature.

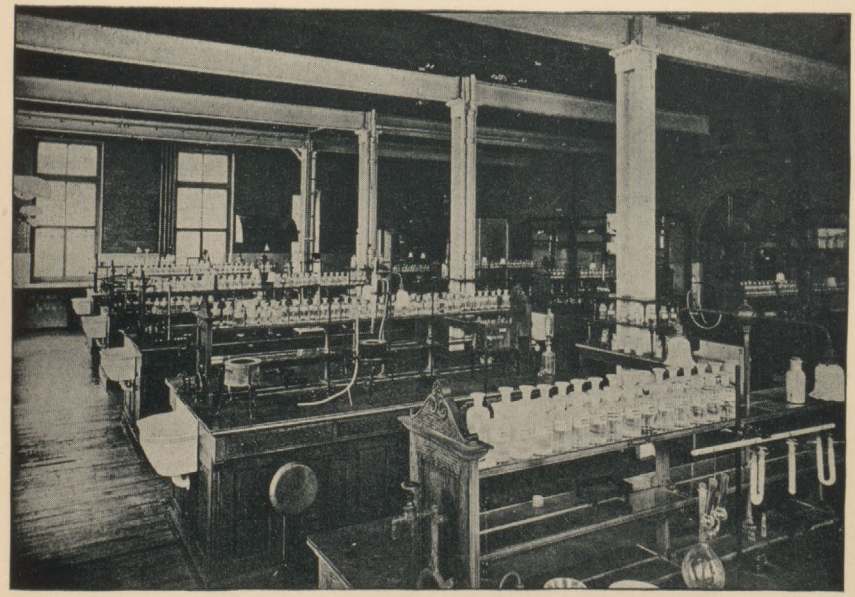
Professor :—Chas. E. Moyse, B.A.
Associate Professor :—P. T. Lafleur, M.A.
Lecturer :—J. W. Cunliffe, D.Litt.
Tutor and Lecturer (Royal Victoria College) :—
Susan E. Cameron, M.A.

Ordinary First Year.

1. A. English Composition.—A course of lectures, chiefly synthetical, on the principles of English composition, with special reference to the use of words and the construction of sentences and paragraphs. Regular essays are required of all students. Text-Books :—Nichol's Manual (or an equivalent). One hour a week.



Macdonald Chemistry Building.—A Lecture Theatre.



Macdonald Chemistry Building.—A Laboratory.

1. B. English Language.—Lectures will be given on the origin of English and its relation to other languages. While the method of treatment will be historical rather than philological, the course will aim at making the student acquainted with the leading features of English at the main stages of its development. Toller's "Outlines of the History of the English Language" (Cambridge Series) will be used for reference, and the illustrative extracts from English authors will be studied. One hour a week.

1. C. English Literature.—Studies of authors and masterpieces of English literature in a course of about twenty-five lectures. For 1902-1903, the subject will be the leading prose Essayists of England from Bacon to Goldsmith. The treatment is critical rather than biographical, the intention being to explain the origin and growth of essay-writing as a characteristic form of modern literary expression, together with the causes which have assisted in permanently establishing its popularity. Incidentally, this course proves ancillary to (1. A) through the opportunity which it offers of discussing analytically the style of the authors under examination. Students will study Craik's Prose Specimens and other special selections from the authors discussed. Two hours a week during the first term.

1. D. European History.—See p. 110.

Second Year.

2. English Literature.—The course will present an outline of English Literature from the Anglo-Saxon Period to the present day, and will be illustrated by printed syllabuses and lantern slides. The general subject will be divided into four periods (Pre-Chaucerian, Italian, French, Popular), and be approached for the most part through literary types. Students are recommended to use Morley's Charts of English Literature. Three hours a week.

Fortnightly Essays will be required on subjects set in connection with the lectures and will be taken into account in determining the standing of students at the end of the session.

Third and Fourth Years.

3. A. English Literature.—Shakspere—This course will begin with a review of the early history of the English drama, and of the conditions which led to its development in the time of Elizabeth. The advances made by the earlier Elizabethan dramatists will be noted, and Shakspere's methods illustrated by a comparative study of A Midsummer Night's Dream, Romeo and Juliet, Henry V, As You Like It, Hamlet, Macbeth, King Lear, and The Tempest; the relation of these plays to their sources will also be considered. Students are recommended to read as many of Shakspere's plays as they can, and to give special attention to those mentioned above.

3. B. A course on Poetry and the Drama England from 1660 to 1789, with special and detailed reference to changes in literary ideals and expression during the period discussed. The lectures will include poets, from Dryden to Crabbe; dramatists, from the writers of Heroic plays to Sheridan. Students will be called upon to pay special attention to the following works: Dryden, Absalom and Achitophel; Pope, Selections from the Essay on Man, and The Rape of the Lock; Thomson, The Seasons (one book); Cowper, The Task (one book); Crabbe, The Borough (four divisions); Dryden, Essay on Dramatic Poesy; Addison, Cato; Goldsmith, She Stoops to Conquer; Sheridan, The School for Scandal. Two hours a week.

3. C. English Language.—The course will consist mainly of the translation and examination of the English Language in its earliest and distinctive stages, and may be taken instead of any two courses in English Literature. From time to time the relation of English to other Teutonic languages will be illustrated. A few Early English texts will be studied with the view of elucidating the later history of English. There will be a series of illustrated lectures in which various details of literature and aspects of life in the period under investigation will be exhibited.

Text-Books:—Sweet, Anglo-Saxon Primer; Anglo-Saxon Reader (the whole). Morris, Specimens of Early English, Part II, Extt. I, II, VI, VII, IX. Four hours a week.

3. D. English Composition.—An advanced course on English Composition, including style, methods and principles of literary criticism treated from the historical point of view, and an introduction to the comparative study of literature in accordance with the most recent results of contemporary thought and research. In connection with this course students will be examined in a course of prescribed readings. Essays at stated periods are required of all.

Books of reference and authorities:—Saintsbury's History of Criticism; Lessing, Sainte-Beuve, Brunetière, Arnold, Ruskin, Worsfold. One hour a week.

Third and Fourth Years.

4. A. English Literature.—A course on the Leading Poets of the Nineteenth Century. The chief aspects of the French Revolution will be considered, and Republican feeling in England illustrated, chiefly from the works of Wordsworth, Coleridge, and Southey. The indirect revolutionary poets Byron and Shelley will then be considered, and their typical poems, together with those of the poets already mentioned, critically examined. The remainder of the course will be given to Scott, Keats, Tennyson, Browning and Swinburne. Two hours a week.

The following poems have been selected for private reading. A paper will be set on them at the sessional examination of the Fourth Year:

Wordsworth:—The Scholars of the Village School of—; Two April Mornings; The Fountain; The Peak of Weatherlam, in the Prelude—("One Summer evening (led by her) I found," Book I); Lucy Poems; "Earth has not anything—;" Hart-leap Well; Tables Turned; Lines written in early spring; To my Sister; Excursion—The Vision in the Skies, ("So was he lifted gently from the ground," Book II); The Child and the Shell, ("I have seen a curious Child," Book IV); Laodamia; "It is a beauteous evening"; "The world is too much with us"; "Scorn not the Sonnet"; "Milton, thou shouldst be living"; Daffodils; The Yarrow Poems. Coleridge:—Dejection; Ode to France; Lines to a

Gentleman, composed on the Night after his Recitation of a Poem on the Growth of an Individual Mind; Love; Youth and Age; Fancy in Nubibus; Christabel; Hymn before sunrise in Vale of Chamouni. Scott:—Lady of the Lake; Wild Huntsman; Fire King. Byron:—A Distant View of Harrow on the Hill; Childish Recollections; Manfred; Childe Harold, Canto I. Keats:—Isabella; Ode to a Grecian Urn; Chapman's Homer. Shelley:—Ode to the West Wind; The Cloud; The Skylark; Alastor; Ozymandias; Adonais. Tennyson:—The Princess; In Memoriam. Browning:—Christmas Eve and Easter Day; Saul; Johannes Agricola; Pictor Ignotus; Fra Lippo Lippi; Andrea del Sarto; The Bishop orders his Tomb at Saint Praxed's Church; Bishop Blougram's Apology.

4. B. A general course on the history of English Prose Fiction from Richardson to the middle of the nineteenth century, treating of the various forms successively given to English novels during the period, and the influences that stimulated or otherwise affected such productions. While students are expected to show particular knowledge of English masterpieces in this kind, frequent reference to cognate works by continental writers will also demand some familiarity with contemporary European literature. Portions of the following works will be selected for detailed study and discussion: Richardson, Clarissa Harlowe; Fielding, Amelia; Goldsmith, The Vicar of Wakefield; Godwin, Caleb Williams; Walpole, The Castle of Otranto; Thackeray, Henry Esmond. *Books of reference*:—Raleigh, The English Novel; Dunlop, History of Fiction; Tuckerman, Jeaffreson. Two hours a week.

4. C. English Composition.—The statement respecting 3 D (p. 97), indicates the method and character of this course, which is regarded as a continuation of the course in the Third Year.

Honours. Third Year. Honour students of the Third Year will take courses 5 and 6 in addition to the ordinary English requirements of the Third year in language *and* literature.

5. Chaucer, Spenser and Milton.—Chaucer will be considered with reference to the social life of his time, which will be illustrated from his works, chiefly from the Prologue to the Canterbury Tales. He will then be discussed with the view of bringing out not only his intrinsic merits, but his connection with French and Italian literature and his relations to his predecessors and successors in English poetry.

Students will read the following works for examination: Prologue to the Canterbury Tales; The Knightes Tale; The Parlement of Foules; The Hous of Fame.

Two hours a week up to Christmas.

After Christmas, Spenser and Milton will be studied, first in relation to the political and religious life of their times, and afterwards as to their poetic development and influence.

Students will read the following works for examination: Mother Hubbard's Tale; Colin Clout's Come Home Again; Epithalamium; Faerie Queene, Bk. 1; Milton's English Poems of the First Period (to 1637); Paradise Lost, Bks. I and II.

Two hours a week.

6. Prose writers before Dryden.—The main object of the course will be to discuss the chief literary influences visible in the Pre-Restoration writers of English prose and to examine characteristics of style. The subject will be treated chronologically. As the course is largely interpretative and critical, facts of biography will be used only when they illustrate points of moment.

Students will read the following works for examination: More, Utopia; Sidney, An Apologie for Poetry (Cook); Lodge, Rosalynd (Collier's Shakespeare's Library); Bacon, New Atlantis; Earle, Microcosmographie (Arber); Milton, Areopagitica (Hales).

Two hours a week.

Honour students of the Fourth year will select Language *or* Literature. **Honours. Fourth Year.**

Language.—The main subjects of study will be Anglo-Saxon, Middle English and Mœso-Gothic. Elementary

courses may be given in Icelandic and Old Saxon if thought desirable.

7. Anglo-Saxon.—The whole of *Béowulf* will be read in class and illustrated by notes on origins, philology and textual emendations. *Text-Book*: Harrison and Sharp's *Béowulf* (Ginn). Students will read selected portions of other poems for examination. Anglo-Saxon prose will be studied mainly in the translation of Gregory's Pastoral Care and Ælfric's Homilies. Students will be guided in the examination of dialectal texts and referred to important articles in periodical literature dealing with that subject and also with the field of Anglo-Saxon generally.

Three hours a week.

8. Middle English.—The course is intended to give a knowledge of dialectical English and to illustrate the changes the language has undergone. The texts given in Morris's Specimens of Early English, Part I, and Morris and Skeat's Specimens of Early English, Part II, may be regarded as the chief material for study. A list of books of reference and of important monographs will be given at the commencement of the course.

Two hours a week.

9. Mœso-Gothic.—The course on Mœso-Gothic is intended to open the way to the comparative study of allied Teutonic languages. Particular attention will be given to the phonological relations of Mœso-Gothic and Anglo-Saxon. *Text-Books*: Wright, Primer of the Gothic language ; Ulfilas (Heyne).

Literature.—The courses in Literature deal mainly with the post-Restoration period. Two of them are of general character and two are limited to individual authors. The latter may be supplemented by courses on Wordsworth and Tennyson.

10. Modern Prose Writers.—After a short sketch of the earlier history of English prose, attention will be directed to the development of periodical literature and the rise of jour-

nalism. The influence of leading essayists upon their contemporaries and successors will be analysed, with special reference to the works of Carlyle, Ruskin, Matthew Arnold and Robert Louis Stevenson. Some account will be given of modern newspaper organization and its relation to present-day literature.

Students will read the following works for examination: Carlyle, Heroes and Hero Worship; Ruskin, Crown of Wild Olives; Arnold, Essays in Criticism, Second Series (Macmillan); Stevenson, Virginibus Puerisque.

Two hours a week.

11. Comparative Literature.—A course of lectures on the influence of English literature upon the continent of Europe, chiefly during the eighteenth and nineteenth centuries. The treatment discusses mainly the historical development of ideas, but examines also corresponding modifications regarding literary method and form.

Voltaire, Letters concerning the English Nation; Elton, The Augustan Age; Texte, Jean Jacques Rousseau and the Cosmopolitan Spirit in Literature (tr. Matthews); Brunetière, L'Evolution des Genres.

Two hours a week.

12. Shakspere.—The history of Shaksperean criticism, textual and æsthetic, will be traced from its beginnings in England and Germany to the present time. Students will be directed to make themselves acquainted by private reading with the most important problems and results of modern research.

Two hours a week before Christmas.

13. Browning.—This course will aim at explaining Browning's view of the poetic art, his characteristic methods, and his outlook on the life and thought of his time. Selected shorter poems will be studied in class, and detailed lists of these, arranged under subject-headings, will be supplied for private reading.

Two hours a week after Christmas.

Department of Modern Languages.

PROFESSOR :—HERMANN WALTER, M.A., PH.D.

LECTURERS :— LEIGH R. GREGOR, B.A., PH.D.; E. T. LAMBERT, B.A.; J. L. MORIN, M.A.

TUTOR AND LECTURER (ROYAL VICTORIA COLLEGE) :—
MLLE. MILHAU, LIC. UNIV. FR.

A.—French.

Owing to the position which this University occupies in the midst of a very large French-speaking population, there is a permanent demand for courses of a practical, conversational character; for the same reason, the Department profits by the co-operation of French church services, French family life, French newspapers, French theatres, French literary clubs, public lecture courses in the French language.

In drawing up the following dual courses endeavours have been made to meet the special needs of the professional men of the Province of Quebec (every student being given the opportunity to learn to speak French), and also to provide for the maintenance of scientific methods. In Courses 1 and 3, the study of Grammar and Literature is carried on in accordance with the usual academic traditions, the French language being, however, largely used in class instruction. In Courses 2 and 4, the method of teaching is of a more practical character; the French language only is used, and the texts prescribed are made the subject of conversation, analysis, *résumés*, etc. In the Third and Fourth years all lectures are given and all studies carried on in French.

Students will take as part of their Honour Course in Modern Languages that part of Section I, A, of the course on Comparative Philology (p. 93), which deals with the general principles of linguistic development.

Ordinary. First Year. 1. Macmillan's Third French Course.—The following texts will also be studied: Mérimée, Colomba (Heath & Co.); Augier, Le Gendre de M. Poirier (Heath & Co.); Fortier, Sept Grands Auteurs du XIXe Siècle (Heath & Co.).

2. Historiettes Modernes, Vol. I (Heath & Co.); Lamartine, Scènes de la Révolution Française (Heath & Co.); Lafontaine, Fables (Holt & Co.); Daudet, Trois Contes Choisis (Heath & Co.).

There will be regular written exercises. Great importance will be attached to correct pronounciation, which will be taught phonetically.

The examinations for the students of affiliated Colleges will include the whole of Courses 1 and 2. Equivalents for the oral work of Course 2 and the oral examination will be stated on application.

Four hours weekly, two for each course.

3. Summer Readings.—Racine, Andromaque (Holt & Co.). **Second Year.**

Sessional Lectures.—Bertenshaw and Janau's Manual (Longmans); Corneille, Le Cid (Heath & Co.); V. Hugo, Les Misérables (Ginn & Co.); Loti, Pêcheurs d'Islande (Heath & Co.).

About six lectures on Historical French Grammar will be given in the course of the session.

4. Pages choisies des Mémoires du Duc de Saint Simon (Ginn & Co.); Molière, Le Bourgeois Gentilhomme (Heath & Co.); Mansion, Petite Esquisse de la Litérature Française (McDougall, London).

The examination for the students of Affiliated Colleges will include the whole of Courses 3 and 4. Equivalents for the oral work of Course 4 and the oral examination will be stated on application.

Four hours weekly, two for each Course.

5. These Courses will consist mainly in the study of French Literature. Typical selections from the works of great writers of every period, and the whole of the subjoined lists of texts will be studied. There will be regular French Compositions on literary subjects. **Third and Fourth Years.**

Summer Reading.—Molière, Tartuffe (Heath & Co.).

Sessional Lectures.—Literature up to the end of the XVII Century. Corneille, Horace (Hachette); Cinna **1902-1903.**

(Clarendon Press); Racine, Britannicus (Hachette); Molière, Le Bourgeois Gentilhomme (Hachette); Boileau, L'Art Poétique (Pitt Press); Bossuet, Oraison Funèbre sur le Prince de Condé; Mme. de la Fayette, La Princesse de Clèves; Gazier, Petite Histoire de la Littérature Française (Armand, Colin et Cie, Paris).

1903-1904. 6. Lesage, Gil Blas (Heath & Co.); Marivaux, Le jeu de l'Amour et du Hasard (Hachette); J. J. Rousseau, Selections; Voltaire, Mérope (Hachette); V. Hugo, Hernani (Heath & Co.); Musset, Selections (Ginn & Co.); Balzac, Eugénie Grandet; Banville, Gringoire (Allyn and Bacon).

N.B.—In order to be admitted to the above classes a student must understand French well enough to take lectures delivered in French.

Four hours weekly.

Honours. Third and Fourth Years. The work of the Honours Classes in French is divided into three sections. The First includes the Historical study of the French Language, the Second, the History of French literature, the Third, French Composition and the Reading and Study of French Texts. The First and Second Sections are taken up in alternate years, the Third annually. Students of the Third and Fourth Years take lectures together. In order to obtain honours, candidates must be able to speak French fluently.

History of Literature 1902-1903. 7. Inasmuch as the Ordinary Course provides a comprehensive survey of French Literature, Honour Students will be required to make a special study of certain men, movements and periods; to write *résumés* in the French language of Chapters of the larger Literary Histories dealing with limited periods, of Biographies, Articles in the Critical Reviews, Monographs, etc.

A special course will be delivered on the history of French Drama.

Three hours weekly.

Philology, 1903-1904. 8. This course will deal with the Historical development of the French language from its origin to the present day. The Old French Period will receive special attention, and

in this connection the oldest texts, Serments de Strasbourg, Cantilène de Sainte Eulalie, short portions of the Passio Christi, Vie de Saint Léger, Vie de Saint Alexis (Koschwitz, Les plus anciens monuments de la langue française, and Gaston Paris, Vie de Saint Alexis), and longer extracts from the Chanson de Roland (Gaston Paris), will be read and interpreted. Students will receive assistance in acquiring a fair reading knowledge of Old French subsequent to the *Roland*. Provençal grammar will necessarily be referred to. Students will make constant use of Schwan's Altfranzösische Grammatik (revised by Behrens), Darmesteter's Cours de Grammaire Historique, Nyrop's Grammaire Historique and Horning's Grammar prefixed to Bartsch's Chrestomathie. A large and carefully chosen Romance library is placed at their disposal.

Three hours weekly.

Texts and Composition.

9. Composition.—Students will receive instruction in the Art of Composition. They will be required to write a number of French papers on literary and other subjects.

Texts.—Before entering on their Third Year Course, Honour Students are expected to have read the following: Corneille, Le Cid, Horace, Cinna, Polyeucte; Racine, Andromaque, Britannicus, Phèdre, Athalie; Molière, Ecole des Femmes, Misanthrope, Tartuffe, Le Bourgeois Gentilhomme, Femmes Savantes; Boileau, L'Art Poétique.

Further readings illustrative of literary movements of the XVI, XVII, XVIII and XIX centuries will be suggested in connection with the work of Course 7.

B. German.

The ordinary Courses mainly keep practical ends in view. In the first two years special attention is given to Grammar, in the Third and Fourth to Literature. Texts are carefully studied from the æsthetic and critical as well as from the historical and linguistic points of view. A considerable amount of translation is done in class, English-German exercises in the prescribed text-books on Grammar

being supplemented by the translation into German of easy prose passages and the re-translation of texts. Importance is attached to correct and expressive reading aloud.

Ordinary. Beginners' Course. 1. The Joynes-Meissner German Grammar, (Heath & Co.); Huss, German Reader (Heath & Co.); Baumbach, Der Schwiegersohn (Heath & Co.); Riehl, Fluch der Schönheit (Heath & Co.); Schiller, Maria Stuart (Heath & Co.); Gutzkow, Zopf und Schwert (Pitt Press).

Tutorial classes conducted during May and June enable students to overtake work not completed by the close of the Winter Session.

Four hours weekly.

First Year. 2. The Joynes-Meissner German Grammar, Deutsche Novelletten, Vol. II. (Heath & Co.); Schiller, Maria Stuart (Heath & Co.); Freytag, Die Journalisten (Holt & Co.); Gutzkow, Zopf und Schwert (Pitt Press); Horning's German Composition; Colloquial Exercises.

Four hours weekly.

Second Year. Summer Readings.—Hauff, Lichtenstein (Heath), and Lessing, Nathan der Weise (Heath & Co.).

3. Sessional Lectures.—The Joynes-Meissner German Grammar; Schiller, Jungfrau von Orleans (Heath & Co.); Freytag, Aus dem Jahrhundert des Groszen Krieges (Heath & Co.); Schiller, Ballads (Heath); Goethe, Goetz von Berlichingen (Heath & Co.); Keller, Bilder aus der Deutschen Literatur (American Book Co.); Horning's German Composition.

Four hours weekly.

Third and Fourth Years. Summer Readings.—Schiller, Wilhelm Tell (Heath & Co.), and Sudermann, Der Katzensteg (Heath & Co.).

1902-1903 4. Sessional Lectures.—Goethe, Egmont (Ginn & Co.); Schiller, Wallenstein's Lager and Wallenstein's Tod (Holt & Co.); Goethe, Selections from his poems (Heath & Co.); Sudermann, Frau Sorge; Grillparzer, Sappho (Macmillan). Translation of prose passages from English into German. History of Literature: Goethe and XIX Century (Kluge).

1903-1904 5. Goethe, Dichtung und Wahrheit (Heath & Co.); Goethe, Iphigenie auf Tauris (Pitt Press); Lessing, Emilia

Galotti (Heath & Co.); Schiller, Historische Skizzen (Clarendon Press); Heine, Poems (Heath & Co.).

Translation of prose passages from English into German; History of Literature up to the middle of the 18th Century (Kluge).

Four hours weekly in each year.

Honours Third and Fourth Years.

The work of the Honours Classes in German is divided into three Sections. The First includes the Historical study of the German Language; the Second, the History of German Literature; the Third, German Composition and the Reading and Critical study of Texts. The First and Second sections are taken up in alternate years; the Third annually. Students of the Third and Fourth Years take lectures together. Language in German is taken up in the same Session as Literature in French, and *vice versa*. The German language alone is used in class instruction.

In order to obtain Honours, candidates must be capable of speaking German fluently.

Philology. 1902-1903.

6. (*a*) a general outline of the development of the German language from its origin to the present day, in the course of which the operation of the principal laws exemplified in the growth of the language will be traced.

(*b*) an introductory course in Old High German, regarded chiefly in its relation to the evolution of the German language.

(*c*) a special study of the Middle High German period; its language and literature, with selected texts.

The following books will be used:—Bachmann, Mittelhochdeutsches Lesebuch (Fäsi & Beer, Zürich); F. Kaufmann, Deutsche Grammatik; Wright, Middle High German Primer (Clarendon Press): Wright, Old High German Primer (Clarendon Press).

Three hours weekly.

History of Literature, 1903-1904

7. Inasmuch as the Ordinary Course provides a comprehensive survey of German Literature, Honour Students will be required to make a special study of certain men, movements and periods, to write *résumés* in the German Language

of Chapters of the larger Literary Histories dealing with limited periods, of Biographies, Articles in the Critical Reviews, Monographs, etc.

A course of lectures will be given on the History of the German Drama.

Three hours weekly.

Texts and Composition.

8. COMPOSITION.—Students will be required to write a number of papers on literary and other subjects.

TEXTS.—Before entering on their Third Year Course Honour Students are expected to have read the following: Lessing, Minna von Barnhelm or Nathan der Weise; Schiller, Wilhelm Tell, Maria Stuart, Jungfrau von Orleans, Wallenstein, Ballads; Goethe, Goetz von Berlichingen, Egmont, Hermann und Dorothea, Poems (Heath).

Further readings illustrative of literary movements of the XVI, XVII, XVIII and XIX centuries will be suggested in connection with the composition and course.

Italian.

LECTURER :—LEIGH R. GREGOR, B.A., PH.D.

The following course, given in alternate years, is intended for students who have passed the Intermediate examination. Partial students who wish to join the class must give satisfactory evidence of their ability to keep up with the undergraduates.

1903-1904

Grandgent, Italian Grammar (Heath & Co.); Grandgent, Italian Composition (Heath & Co.); De Amicis, Selections from Il Cuore; Manzoni, Selections from I Promessi Sposi; Martuscelli, Raccolta di scelte poesie (Chiurazzi, Naples); Selections from the Divina Commedia; Notes on some of the great names of Italian Literature.

Semitic Languages.

PROFESSOR :—D. COUSSIRAT, B.A., B.D., D.D., OFFICIER DE L'INSTRUCTION PUBLIQUE.

The course comprises lectures on the above languages and their literature, their genius and peculiarities. Comparative philology, affinity of roots, etc., also receive due attention,

while the portions selected for translation will be illustrated and explained by reference to Oriental manners, customs, history, etc.

1. Hebrew grammar and translation. English rendered into Hebrew. Masoretic notes explained. The Hebrew text compared with the Septuagint and Vulgate Versions. **Ordinary. Second Year.**
Four hours a week.
This course may also be taken as a course in either the Third or Fourth Years, by students who have not taken it in the Second Year.

2. Hebrew Syntax. Translation of difficult passages of the Old Testament. Notes on the Massora and the Talmud (Mishna and Gemara.) Aramaic Language. **Third Year.**

3. Translation continued. Characteristics of the Semitic Languages, particularly of Aramaic, Syriac, Samaritan, Rabbinic, Arabic, Assyrian, Semitic Inscriptions. **Fourth Year.**
Four hours a week for the combined courses.

4*a*. Hebrew.—Genesis. Isaiah, 40-66. Ecclesiastes. *Literature.*—F. Lenormant, The Beginnings of History. **Honours. Third and Fourth Years.**

Hebrew.—The course for the Second Year.

Hebrew.—The course for the Fourth Year.

4*b*. Aramaic.—Daniel. Ezra. Selections from the Targums. *Literature.*—Sayce, Lectures on the Origin and Growth of Religion.
Two hours a week.

5*a*. Hebrew.—Malachi, Psalms, 1-72; Job, 26-42. *Literature.*—Renan. A general History of the Semitic Languages.

5*b*. Syriac.—Selections from the Peshito, and from the Chronicles of Bar Hebræus. *Literature.*—W. Wright, Comparative Grammar of the Semitic Languages.
Two hours a week.

History.

PROFESSOR :—CHARLES W. COLBY, M.A., PH.D.

LECTURER :—STEPHEN B. LEACOCK, B.A.

Ordinary. First Year

1. The Main Epochs of European History.

Twenty-four lectures will be given on as many subjects, taken from Ancient, Mediæval and Modern History. The design of the course is less to present a mass of facts than to illustrate the chief features of racial, political and social progress. When the class first meets each student will receive a syllabus containing a list of topical readings. The sessional examination will be based mainly on these and on the following text-book:—"European History," by G. B. Adams (Macmillan). The results of the examination will be counted under the head of English. Students will be required to present short essays on historical subjects at regular intervals. A few illustrated lectures may also be given if suitable hours can be found. The use of Putzger's Historischer Schul-Atlas is recommended.

Two hours a week during the second term.

Third or Fourth Year.

2. The Mediæval and Modern History of Europe, 378-1789.

This is a general course dealing with the historical development of European nations from the German Inroads to the beginning of the French Revolution. Special attention will be devoted to institutions and movements. Topics for investigation will be frequently assigned, and students will write at least one thesis during the year. Apart from topical readings, the following books are prescribed:—

Bryce, The Holy Roman Empire (Macmillan); Emerton, Mediæval Europe (Ginn); Seebohm, The Era of the Protestant Revolution (Longmans); Gardiner, The Thirty Years' War (Longmans); Grant, The French Monarchy, Vol. II. (Cambridge University Press).

Fours hours a week.

3. The Renaissance.

Honours. Third and Fourth Years.

During the Session of 1902-1903, this course will be devoted to the study of Italian life and thought in the Fifteenth Century. While the intellectual aspects of the Renaissance will be chiefly considered, social and political questions will also receive a share of attention. There will be general lectures, a detailed discussion of particular points, and special reports by members of the class. One thesis may also be demanded.

Two hours a week.

4. The Reformation. Three hours a week. (Omitted in 1902-1903).

Honours. Third and Fourth Years.

5. The Seventeenth Century. Three hours a week. (Omitted in 1902-1903).

6. The Political and Constitutional History of Europe since 1789. Four hours a week. (Omitted in 1902-1903).

7. English Constitutional History—1307.

Ordinary and Honours. Third and Fourth Years.

The lectures of this course will follow the organic development of the English constitution from the earliest period to the death of Edward I, and they will also embrace some comparison of English political institutions with those of continental Europe. The later constitutional history of England will be among the subjects treated under Political Science. See p. 116. Two hours a week.

8. Canadian History, 1608-1791. (This course will be given in 1903-1904).

9. The Political and Constitutional History of the United States.

Honours. Fourth Year.

This course will comprise a study of the foundation of the American colonies and of the establishment of self-government in them; the origin and formation of the constitution of the United States; the political and constitutional history of the American Union and the development of Federal constitutional law as affected by the more important decisions of the Supreme Court. Four hours a week.

Books recommended for reference:—

For the Colonial Period.—J. A. Doyle, The English in America, 3 Vols., or R. G. Thwaites, The Colonies, Vol. I. of Epochs of American History.

For the Origin and Formation of the Constitution.—A. B. Hart, Formation of the Union, Vol. II. of Epochs of American History, or G. T. Curtis, Constitutional History, Vol. I., or J. Fiske, Critical Period of American History.

For the History of the United States under the Constitution.—Ed. Channing, The United States of America, 1765-1865 (Cambridge Historical Series); or Alex. Johnston, History of American Politics, or Goldwin Smith, The United States.

The following biographical studies, illustrative of the history of the union, may also be read with great advantage: Thomas Jefferson, Alexander Hamilton, Daniel Webster, Andrew Jackson, Henry Clay (2 Vols.), John Quincy Adams, John C. Calhoun, all of which are published in the American Statesmen Series (Boston, Houghton), and Carl Schurz's Abraham Lincoln (Boston, 1891).

Texts.—Honour Students in History will be examined at the end of the Third Year on the following texts:—

Herodotus, VI.—VIII., Macaulay's trans.; Thucydides, I, II, 1—65, VI, VII., Jowett's Trans.; Plato, The Republic, Jowett's trans.; Plutarch, The Lives of Aristides, Themistocles, Pericles and Timoleon, Clough's trans.; Polybius, I, II, V, Shuckburgh's trans.; Livy, XXI-XXII, Church and Brodribb's trans.; Tacitus, Annals II, Germania, Vita Agricolae, Church and Brodribb's trans.

Honour students in History will be examined at the end of the Fourth Year on the following texts:—

Clarendon, History of the Rebellion, Book XI; Gibbon, Decline and Fall, chaps. XLIV, L, LI, LXVI; Burke, Reflections on the French Revolution; Macaulay, History of England, chap. III; Bagehot, The English Constitution; Stubbs, Select Charters, Introduction; Lord Acton, German Schools of History, English Historical Review, Vol I; Mat-

thew Arnold, Pagan and Mediaeval Religious Sentiment, in Essays in Criticism (First Series); Captain Mahan, The Influence of Sea Power on History; Langlois et Seignobos, Introduction aux Etudes Historiques, trans. G. G. Berry; Bryce, The American Commonwealth.

Summer Readings.—Students who intend to take History 2 are advised to read the books prescribed under that course, during the summer vacation.

In connection with History 3, Honour students of the Third and Fourth Years are advised to read the following books during the summer vacation:—

Burckhardt, Civilization of the Renaissance in Italy (Macmillan); Symonds, Age of the Despots, Revival of Learning, The Fine Arts (Holt); Creighton, History of the Papacy, Martin V—Paul II (Longmans); Lodge, The End of the Middle Ages (Macmillan).

In connection with History 7, the following books may be read during the summer:—Stubbs, Constitutional History of England, Vol. I (Clarendon Press); Freeman, Growth of the English Constitution (Macmillan); Montague, Elements of English Constitutional History (Longmans).

The books for History 9 will be found under the head of that course.

Honour Courses in History and Economics.—Beginning with the Class of 1904, a combined course for Honours in History and Economics will be offered, with a choice between studies (A) chiefly in history and politics, and (B) chiefly in economics and politics. The courses of lectures prescribed for Honour students are as follows:—

A. 3rd Year.—History, 2, 3, 7;
Political Science, 6;
Economics, 1.
4th Year.—History, 3, 7, 9;
Political Science, 7 or 8;
Economics, 2, 3.*

* For Economics 2, 3, may be substituted Art and Archaeology (half course) and History of Philosophy (half course).

B. 3rd Year.—Economics, 1, 4, 5;
Political Science, 6;
History, 2.
4th Year.—Economics, 2, 3, 4, 5;
Political Science, 7, 8;
History, 3, 7.

Economics and Political Science.

PROFESSOR :—A. W. FLUX, M.A.
LECTURER :—STEPHEN B. LEACOCK, B.A.

Ordinary. Third or Fourth Year.

1. ELEMENTS OF ECONOMICS.

The scope and method of Economic Science; the organization of production; the theory of value; the distribution of wealth, including the theories of rent, wages, interest and profits; exchange and the mechanism of exchange; the theory of money; international trade; principles of taxation.

Four hours per week throughout the year.

Text-book:—F. A. Walker, Political Economy.

For further reference:—Keynes, Scope and Method of Political Economy; Hadley, Economics; Marshall, Principles of Economics; J. S. Mill, Principles of Political Economy, Book III; Jevons, Money and the Mechanism of Exchange; Bastable, Theory of International Trade; Sidgwick, Principles of Political Economy, Book III.

Honours. Fourth Year.

2. HISTORY OF ECONOMIC THEORY.

The development of economic doctrine will be traced, especially in relation to the special contributions of individual writers of great prominence. The mercantilist doctrine will be examined, and the work of the Economistes, of Adam Smith, Malthus, Ricardo, J. S. Mill, Cliffe Leslie, Jevons and other English writers, and of the Austrian school, and recent developments by American writers will be considered. A closer examination of economic theories treated of in the preceding course will be made.

Text-books:—Price, Short History of Political Economy in England; Cohn, History of Political Economy.

Works of Reference:—Cossa, Introduction to the Study of Political Economy; Ingram, History of Political Economy; Sewell, The Theory of Value before Adam Smith; Cannan, History of the Theories of Production and Distribution; together with the treatises of writers named, or referred to above.

Four hours per week during the first half of the Session.

3. (*a*) Currency, Banking and Trade.—Nature and functions of Money, the currency systems of the leading nations, index-numbers and their interpretation, banks and their functions, commercial crises, foreign exchanges, bimetallism. A study of trade organization in connection with the circulation of goods will form part of the course. **Honours. Fourth Year.**

Text-books:—Nicholson, Money and Monetary Problems; Horace White, Money and Banking; Dunbar, Theory and History of Banking.

Works of Reference:—Bagehot, Lombard Street; Breckenridge, Canadian Banking System; Macleod, Theory and Practice of Banking; Laughlin, History of Bimetallism in the United States; Jevons, Investigations in Currency and Finance.

Four hours per week during the second half of the Session.

(*b*) The Theory of Distribution.

Two hours a week (omitted in 1902-3).

4. Seminary in Economics.—

In connection with courses 2 and 3, a study of the writings of leading economists will be carried on, reports made, and methods of investigation illustrated practically. Opportunity will also be afforded for corresponding work in connection with courses 5, 7 and 8 (see below). The meetings of the Seminary will be weekly.

5. (*a*) History of Industry and Commerce.—The development of industry, agriculture, transportation and commerce from the middle of the eighteenth century; commercial policy and its changes; colonial development; industrial legislation and the growth of associative effort will be treated. **Honours Third and Fourth Years.**

Two hours per week throughout the session.

Text-book :—Gibbins, Economic and Industrial Progress.

Works of Reference :—Toynbee, The Industrial Revolution; Bærnreither, English Associations of Working Men; Cunningham, Growth of English Industry and Commerce (Vol. II., Modern Times); Webb, History of Trade Unions; Porter, Progress of the Nation.

Select readings on special topics from general works or from more or less technical writings will also be given in connection with this course, and reports by members of the class upon special topics will be prepared.

(*b*) Public Finance.

Two hours a week (omitted in 1902-3).

Ordinary. Third or Fourth Year.

6. Elements of Politics.—The introductory part of the course will deal with the general principles of political science, the nature of the State and the different theories of its purpose and origin.

The main work of the year will consist of a study of comparative national government. The constitutions, governments and political parties of Great Britain and the United States will be treated in detail. The governmental systems of continental Europe will also be examined.

Four hours per week throughout the Session.

Text-Book :—The State (Woodrow Wilson).

Books of Reference :—Sidgwick, Elements of Politics; Burgess, Political Science and Constitutional Law; Anson, Law and Custom of the Constitution; Bryce, American Commonwealth; Bodley, France; Lowell, Governments and Parties in Continental Europe.

Honours. Fourth Year.

7. History of Political Theory.—A half course of 50 lectures. Only a brief summary of Ancient and Mediæval political philosophy will be attempted. The chief part of the course will be devoted to the political speculation of the 18th and 19th centuries.

Four hours per week for the first half of the Session.

Books of Reference :—Sir F. Pollock, History of the Science of Politics, and the political works of Hobbes, Locke,



Macdonald Chemistry Building.—A Research Laboratory.



Macdonald Mining Building.—An Assay Room.

Montesquieu, Rousseau, Burke, Bentham, J. S. Mill, Herbert Spencer, Bluntschli, and Sir Henry Maine.

Honours. Fourth Year.

8. Relations of the State to Economic Organisation.—A half course of 50 lectures. The course will consist of a detailed examination of the functions exercised by the State in industrial control. Modern legislation and legislative theories will be discussed in reference to their economic effects. Reports by members of the class upon special topics will be made a prominent feature of the work. Four hours per week for the second half of the Session.

Books of Reference :—Sidgwick, Elements of Politics, chaps. IV, IX, X; Farrar, The State in Relation to Trade; Jevons, The State in Relation to Labour; Frankenstein, Der Arbeiterschutz, seine Theorie und Politik.

Summer Readings.—Students who intend to follow the Honour course in Economics and Political Science are advised to read, during the summer vacation preceding the commencement of that course, the books prescribed for the Scholarship examination in those subjects (see p. 61).

During the summer vacation following the third year they are advised to study the following books :—

Adam Smith, Wealth of Nations; Ricardo, Principles of Political Economy and Taxation; J. S. Mill, Principles of Political Economy; and such of the works referred to in connection with course 7 (see p. 116) as may be available for use.

Honour Courses.—Students of the Third Year who are candidates for Honours in History and Economics, and select Course B (see p. 114), will take the following courses of lectures: History, 2; Economics, 1, 4, 5; Political Science, 6. Students of the Fourth Year who are candidates for Honours in History and Economics, and have selected Course B, will take the following courses of lectures: History, 3, 7; Economics, 2, 3, 4, 5; Political Science, 7, 8.

Evening Lectures. In the Session of 1902-3, a course of weekly lectures, open to the public, will be delivered on Money, Banking and the Foreign Exchanges. The hour of the lectures will be 8.15 p.m. For particulars as to fees, etc., apply to the Registrar.

Constitutional Law.

PROFESSOR :—DEAN WALTON (FACULTY OF LAW).

The Constitutional Law of Canada will be treated in the following order:—1. Canadian Constitutional History prior to Confederation. 2. The British North America Act, and the leading cases under it which illustrate the respective powers of the Dominion and the Provinces. 3. The fundamentals of English Constitutional Government which form the basis of the Canadian Constitution. 4. The Cabinet System. 5. The difference between English and French practice as to responsibility of officials.

Two hours a week.

Roman Law.

LECTURER :—PROFESSOR F. P. WALTON, B.A., LL.B.

1. A Course is offered in Roman Law, open to Third and Fourth Year students in Arts, and qualifying as an option for the B.A. degree. For details, see p. 246.

Art (History of) and Archæology.

LECTURER :—PROFESSOR S. HENBEST CAPPER, M.A.

The course comprises two sessions' work, a half-course (of fifty lectures) being given each session. The lectures, which are illustrated by photographs and casts, lantern-slides and diagrams, are delivered in the Architecture Class-room, Engineering Building, on Monday and Thursday, at 4 p.m.

The fee for the full course (see page 82) is $25.00 ; for each half-course, if taken separately, $14.00 (including Grounds and Athletics).

For Session 1900-1901 the subjects overtaken were principally the architecture and sculpture of the ancient world (Egypt, Assyria, Greece and Rome).

In 1901-02, the first term was devoted to the architecture of the late Roman Empire and of the Early and Later Middle Ages; in the second term the class studied the Painting of the Renaissance in Italy.

In Session 1902-03, it is proposed to study Classical Architecture and Sculpture during the first term, part of the course being devoted to lectures on the topography of Ancient Rome, of Athens and Olympia. In the second term the study of the history of painting will be resumed for the Northern Schools of Europe.

In addition to the class lectures, candidates are expected to show a knowledge of the text-books prescribed and of portions of the books of reference, as indicated in connection with the lectures. A certain number of class essays are prescribed during the session.

Text-books:—Baldwin Brown, "The Fine Arts" (Murray; Scribner); Hamlin, "History of Architecture" (Longmans); any good manual of the history of Painting, such as Poynter's (Sampson Low) or Van Dyke's (Longmans).

Mental and Moral Philosophy.

PROFESSOR :—J. CLARK MURRAY, LL.D.

LECTURERS :— { HILDA D. OAKELEY, M.A.
J. W. HICKSON, B.A., M.A., PH.D.

Ordinary. Second Year.

1 A. In the first term a course on Elementary Psychology. While discussing the phenomena of sensation, and the elementary processes of mental evolution, the lectures also introduce the student to the principles and methods involved in the study of more advanced philosophical problems. While the course follows in its general outline Book I. in Murray's Handbook of Psychology, the student is made acquainted with the leading works in psychological literature, and is expected to study the passages recommended. Occasional essays also are prescribed.

1 B. In the second term a course in Formal Logic and the Fallacies as in Hyslop's Elements of Logic. The lec-

tures endeavour to show the application of logical processes to actual discussion, with special attention to common fallacies exemplified in literature and daily life.

In addition, students will be required to consult Sidgwick, Fallacies; and Lafleur, Illustrations of Logic.

Both classes meet three hours a week.

Advanced Sections. Second Year.

2 A. This course will comprise the following divisions:

a General Introduction to Philosophy; The Origin of Philosophy amongst the Greeks;

b Explanation of the fundamental methods of thought or the principles underlying conception, judgment and inference;

c Analysis of Berkeley's Dialogues between "Hylas and Philonous" as introduction to the Psychological Problem; Perception of a Material World.

Books recommended:—Sidgwick's Introduction to Philosophy; A Dialogue of Plato; Berkeley's Dialogues between Hylas and Philonous.

Writing of papers expected from time to time.

Two hours a week throughout the session.

2 B. General Psychology, including the Elements of Psychophysics.

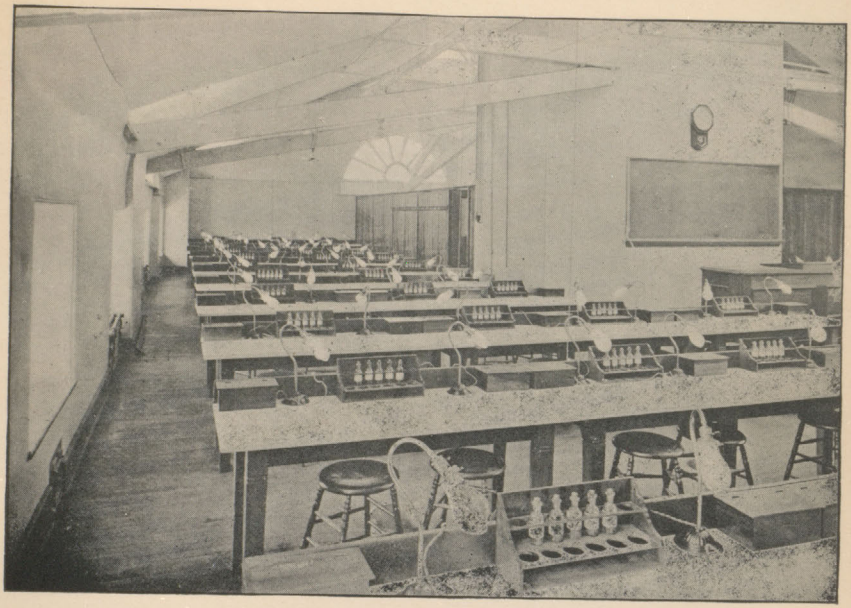
No text-book prescribed, but students will be referred to Wundt's Outline of Psychology, and to the works of Ladd and Külpe.

One hour a week throughout the session.

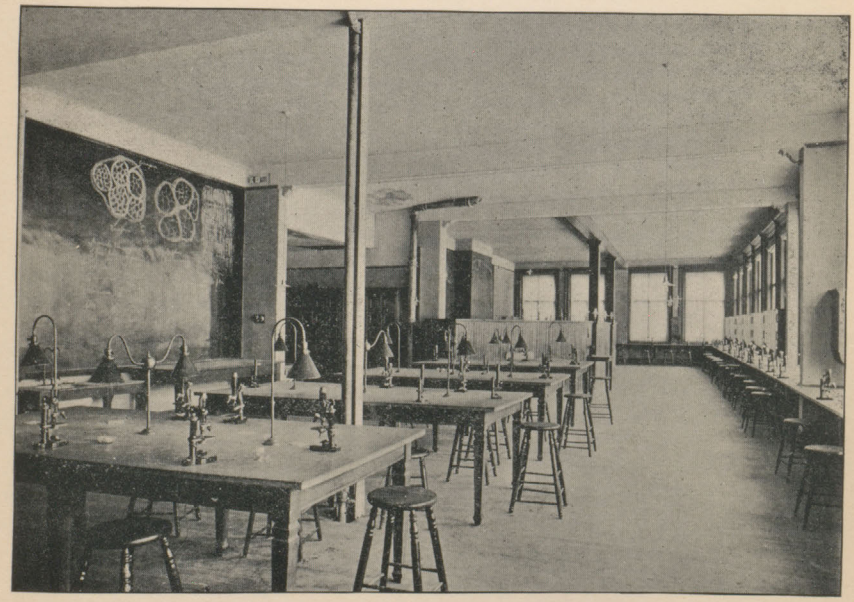
Ordinary. Third or Fourth Year.

3 A. In the First Term a course on the Logic of Scientific Method, including an examination of the fundamental Conceptions and Principles of the Physical and Historical Sciences. In addition to Jevons' Principles of Science and Mills' System of Logic (Books III and VI) students will be referred to Sigwart's Logic, Vol. II; Pearson's Grammar of Science, 2nd ed., and to the writings of E. Mach.

Four hours a week.



In the Zoological Laboratories.



Laboratory of Normal Histology.

B. In the Second Term an advanced course on the Psychology of Cognition, tracing, as far as possible, the principal stages in the evolution of intelligence. The general problem, also, of the nature of knowledge is discussed, in view of the light which it throws on the ultimate nature of reality. The principal topics are indicated in Murray's Handbook of Psychology, Book II; but students are expected also to study selected passages from the most important works on Psychology.

N.B.—In all the classes of Logic, Metaphysics and Moral Philosophy, students are required to write essays or to perform exercises.

Four hours a week.

4 A. History of Modern Philosophy;
First Term: From the Renaissance to Kant.

Four hours a week.

B. Second Term: From Kant to the Present Time.

Text-books recommended:—Falckenberg's History of Modern Philosophy; Höffding's History of Modern Philosophy (2 vols. translated by Meyer).

Four hours a week.

5 A. In the First Term a course on Moral Philosophy, discussing the problem of Ethical Theory.

Four hours a week.

B. In the Second Term a course on Applied Ethics.

While these courses follow in general outline Murray's Introduction to Ethics, the student is expected to read portions of other works recommended.

Four hours a week.

Honours. Third Year.

Candidates for Honours are required to take the ordinary course in Philosophy and the ordinary course either in Economics or in Political Science in one year.

6. A course in Greek Philosophy. This begins with the colonial period, during which philosophical activity was most energetic among the colonies of the Greeks in Asia

Minor and Italy. It then passes on to the Athenian period, beginning about the middle of the fifth century, B. C., when Philosophy found a home in the greatest centre of intellectual life in the ancient world. A third period is then described, during which Philosophy extends its culture over ancient life by the spread of the great schools, especially the Stoical and the Epicurean, which arose towards the end of the fourth century, B. C. Finally, some account is given of the movement, of which Alexandria was the centre, and by which Greek Philosophy was brought into contact with Oriental thought. The history is carried down to the closing of the Pagan Schools in Athens by the Emperor Justinian. Students are expected to make an independent study of the fragments of one of the early philosophers, and to write an essay embodying the results of their study.

Books of Reference: Zeller, History of Greek Philosophy, and Windelband, History of Ancient Philosophy.

Two hours weekly.

7. Plato and Aristotle. In this course it is expected that some work of at least one of these thinkers will be read.

For 1902-3 the Theaetetus is prescribed.

One or two hours weekly.

8. English Phenomenalism, Idealism and Criticism. This course will consist in reading and discussing the principal portions of Locke's Essay concerning the Human Understanding (Books 1, 2, 4), Berkeley's Principles of Human Knowledge, Hume's Inquiry and portions of the Treatise on Human Nature.

Two hours a week.

Honours. Third Year.

9. Theory of Knowledge. This course will be both historical and critical.

Books recommended : — Seth's Scottish Philosophers, Lotze's Logic and selected portions of Bradley's Logic, Bosanquet's Logic and Ritchie's Darwin and Hegel.

One or two hours a week.

Honours. Fourth Year.

10. Reading and discussion of Kant's Critique of Pure Reason, as an introduction to Kantian Philosophy. In connection with this course the following works are recommended : Morris, Kant's Critique of Pure Reason, 3rd edition (Grigg's Philosophical Classics), Caird's Critical Philosophy of Kant, 2nd edition, and Adamson's Lectures on Kant.

Two hours weekly.

11. The Principles and Methods of Ethics.

Books recommended:—Aristotle, Nicomachean Ethics; Sidgwick, Method of Ethics; Green, Prolegomena to Ethics.

Two hours a week.

12. An Introduction to Philosophy. An advanced course dealing with fundamental problems of Metaphysics and with leading types of philosophical theory, such as Materialism, Idealism, Dualism, and Monism. There will be opportunity for informal discussions.

Books of Reference:—Külpe's Introduction to Philosophy; Watson's Outline of Philosophy; Riehl's Metaphysic of Experience (translated by Fairbanks).

Two hours weekly in second term.

In addition to the above mentioned courses there will be an examination at the end of the session on some book or books to be read privately by students. Subjects for the session 1902-3: Spinoza's Ethic, Schopenhauer's Principle of Sufficient Reason and World as Will and Idea.

Students are required to write an essay on Leibnitz's Critique of Locke in the *Nouveaux Essais*.

Mathematical and Physical Sciences.

(*a*) Mathematics.

Professor (Mathematics and Astronomy) :—
A. Johnson, M.A., LL.D.
Lecturer :—Rev. H. M. Tory, M.A.

(*b*) Physics.

Professors :— John Cox, M.A.
E. Rutherford, M.A.
Assistant Professor :—Howard T. Barnes, D.Sc.
Demonstrators:—A. G. Grier, B.Sc., H. L. Cooke, B.A., S. T. Allen, B.Sc.

Ordinary. First Year. 1. Mathematics—Arithmetic.—Euclid, Books 1, 2, 3, 4, 6 (omitting propositions 27, 28, 29), with definitions of Book 5, Todhunter's edition, or Hall and Stevens: the latter is recommended to students in advanced sections especially.—Hall and Knight's Elementary Algebra (omitting Chapters 36, 40, 41, 42); or the same subjects in similar text-books.—Hall and Knight's or Locke's Elementary Trigonometry. Nature and use of Logarithms.
Four hours a week.

Ordinary. First Year. 2. Physics.—This course has two objects: (1) to give the minimum acquaintance with Physical Science requisite for a liberal education to those whose studies will be mainly literary; (2) to be introductory to the courses in Chemistry and other branches of Natural Science, and to the more detailed courses in Physics in the Third and Fourth Years. Only the most important principles in each branch of the subject will be treated, as far as possible with reference to their historical development and mutual relations; and they will receive concrete illustration in the study of the principal instruments in daily use in the laboratory. Two illustrated lectures will be given per week. During the session each

student will be required to attend in the laboratory eight times, and make measurements involving the use of the following instruments:—*Balance, Pendulum, Barometer, Thermometer, Sonometer, Telescope or Microscope, Tangent Galvanometer, Wheatstone's Bridge.*

Outline of Syllabus. The scope and method of Science, Primary Phenomena ("States and Properties of Matter"), Motion, Velocity, Acceleration, Laws of Motion, Momentum, Energy, Work. The Parallelogram Law for Velocities and Forces, Equilibrium and the Simple Machines. Uniform circular motion, Vibration, the Pendulum, Fluid Pressure, the Barometer, Specific Gravity. Summary of *Mechanics*, indicating the principle of the Conservation of Energy.

The missing Energy traced in (1) *Sound.* Nature of wave Motion. Intensity, Pitch and Quality of Musical Notes. The stretched String and Organ Pipe. Resonance.

(2) *Heat.* Temperature and the Thermometer. The Calorimeter, Fusion and Vaporisation. Laws of Boyle and Gay-Lussac. The Mechanical Equivalent. Application of Conduction, Convection and Radiation to common problems of Climate, Ventilation, etc.

(3) *Light.* Reflection, Refraction, the Spherical Mirror, Prism, Lens, Miscroscope, Telescope, Spectroscope, Polariscope. Principle of Interference and sketch of the Undulatory Theory.

(4) *Electricity and Magnetism.* The Electrophorus, the Modern Induction Machine, the Condenser. Coulomb's Law of Force. The idea of Potential. The Quadrant Electrometer. Almospheric Electricity. Magnetic Pole, Moment, Field and Law of Force. The Compass and Terrestrial Magnetism. Effects of Current. The Voltameter and Storage Cell. The Galvanometer. Heating Effects. Simple Batteries. Ohm's Law. Units and Measurement of Current Resistance, Electromotive Force. Mutual Mechanical Effects of Conductors and Magnetic Fields. Principle of the Electric Motor. The Electro-magnet. Induction of Currents,

and Principle of the Dynamo. Applications to Telegraph, Telephone, Lighting, and supply of Power.

Conclusion.—Restatement of Principle of Conservation of Energy in complete form. Dissipation of Energy.
Two hours a week.

Second Year.

3. A. MATHEMATICS.—Algebra.—Exponential and Logarithmic series ; Undetermined Coefficients ; Partial Fractions; Elementary Theory of Probabilities; Elements of Determinants; Geometrical Conic Sections —Solid Geometry (Euclid, Bk. XI and first two props of Bk. XII, or equivalent) :—Spherical Trigonometry (Solution of Spherical Triangles with proofs of the necessary preliminary propositions and formulae).
Text-books:—Hall and Knight's Higher Algebra ; Wilson's Solid Geometry and Conic Sections.
Two hours a week.

3. B. DYNAMICS.—This course is chiefly experimental, and deals with :—Range and Time of Flight of Projectiles ; Morin's Machine ; Laws of direct Impact of Elastic Bodies ; Simple Harmonic Motion ; Simple and Compound Pendulum ; Determination of Gravity; Moments of Inertia, and their Experimental Determination ; Moment of Momentum, and Energy of a Rotating Body.
One hour a week.

Third or Fourth Year.

4. MATHEMATICS.—Elementary Analytical Geometry; Elementary parts of the Differential and Integral Calculus; Simple Differential Equations.
Four hours a week.

ASTRONOMY AND OPTICS.—Two hours a week. Half course.

5. A. Astronomy.—Galbraith and Haughton's Astronomy or Brinkley by Stubbs and Brünnow. Lockyer's Elementary Astronomy (English edition), and Gall's "Easy Guide to the Constellations" are recommended as introductory.—The subject is taken with Optics as a half course. The lectures will be given before Christmas. First term; two hours a week.

5. B. Optics.—Two hours a week, from January to end of Session. *Text-book*:—Galbraith and Haughton.

6. A. Mechanics and Hydrostatics.—*Text-book,* Loney, Mechanics. Half course. **Third Year.**

Experimental Physics.—(*First Course.*)—Laws of Energy, Sound, Light and Heat. *Text-books* :—Deschanel, Part IV, or Ganot or Jones; Heat (Wright's, Longmans).

Lectures fully illustrated; two hours a week, with Laboratory Course, three hours a week.

Laboratory Manuals—Pitcher and Tory; Chandler.

7. A. Sound.—Velocity of Sound; Determination of Rates of vibration of Tuning Forks; Resonance; Laws of vibration of strings. **Third Year.**

7. B. Light.—Photometry; Laws of Reflection and Refraction; Indices of Refraction; Focal Lengths and Magnifying Powers of Mirrors, Lenses, Telescopes and Microscopes; the Sextant, Spectroscope, Spectrometer, Diffraction Grating, Optical Bench and Polariscopes.

7.C. Heat.—Construction and Calibration of Thermometers; Melting and Boiling Points; Air Thermometer; Expansion of solids, liquids and gases; Calorimetry; Specific and Latent Heats; Laws of Vapour Pressure; Radiation; the Mechanical Equivalent of Heat.

Fourth Year. 8. EXPERIMENTAL PHYSICS.—(*Second Course.*)—Electricity and Magnetism. *Text-book*:—Ganot or S. P. Thompson.
Lectures fully illustrated; two hours a week, with Laboratory Course, three hours a week.
Laboratory Manual—Pitcher and Tory.

Fouth Year. MAGNETISM.—Measurement of Pole Strength and Moment of a Magnet; the Magnetic Field; Methods of Deflection and Oscillations; Comparison of moments and determination of elements of Earth's magnetism. Frictional Electricity. Current Electricity.—Complete course of measurements of Current Strength, Resistance and Electromotive Force; Calibration of Galvanometers; the Electro-dynamometer; Comparison of Galvanometers; the Electrometer; Comparison of Condensers; Electromagnetic Induction.

N.B.—For advanced Courses intended for Electrical Engineering Students and Graduates pursuing the study of Physics, see Calendar, Faculty of Applied Science.

(a) Mathematics.

Advanced Sections. First Year. 9. MATHEMATICS.—Hall and Stevens, Euclid; Casey, Sequel to Euclid; Hall and Knight, Advanced Algebra; Todhunter or Burnside and Panton, Theory of Equations (selected course). Two or three hours each week.

Second Year. 10. MATHEMATICS.—Lock, Higher Trigonometry, with McClelland and Preston, Spherical Trigonometry, Part I; Salmon, Conic Sections, chapters 1, 2, 3, 5, 6, 7, and 10 to 13 inclusive; Williamson, Differential and Integral Calculus (selected course).
Three hours a week.

(b) Mathematics and Natural Philosophy.

11. Mathematics.—Williamson, Differential and Integral Calculus ; and Boole or Forsyth, Differential Equations, or Salmon, Geometry of Three Dimensions (alternate years). **Honour Courses. Third and Fourth Years.**

Astronomy.—Godfray.

Two hours a week.

12. Mathematical Physics.—Minchin, Statics, Vol. I (selected chapters) ; Williamson and Tarleton, Dynamics, Chaps. 1 to 8, inclusive; Besant, Vol. I, Hydro-Mechanics, Part I, chaps. 1, 2, 3, 7 ; Parkinson, Optics. **Third Year.**

Two hours a week.

Experimental Physics.—Course 7.

13. Physical Astronomy.—Godfray, Lunar Theory ; or Cheyne, Planetary Theory; Newton, Principia, Lib. I, secs. 9 and 11, with the necessary preliminary propositions. **Fourth Year.**

14. Mathematical Physics.—Minchin, Statics, Vol. II, selected chapters; Williamson and Tarleton, Dynamics; Routh, Dynamics of a Rigid Body (for reference) ; Besant, Hydro-Mechanics; Preston, Theory of Light; Cumming, Theory of Electricity. **Fourth Year.**

Experimental Physics.—Course 8.

Special courses for Graduates and Advanced Students will be delivered during the Session 1902-3, by Professors Cox and Rutherford, at hours to be arranged. Subjects—The Relations between Optics and Electricity ; and Radio-activity.

(c) Experimental Physics.

15. Courses 7, 8, (10 hours a week). Elements of the Calculus; Simple Differential Equations; Elements of Analytical Geometry, Elementary Dynamics of a Particle; Elementary Rigid Dynamics. **Honour Courses. Third Year.**

16. Advanced Courses in Heat, Optics and Electricity. A short course in Physical Chemistry. **Fourth Year.**

Chemistry.

PROFESSORS :—B. J. HARRINGTON, M.A., PH.D., LL.D.
J. WALLACE WALKER, M.A., PH.D.
ASSISTANT PROFESSOR :—NEVIL NORTON EVANS, M.A.SC.
DEMONSTRATORS :—JAMES HENDERSON, B.SC., PH.D.
A. DOUGLAS MCINTOSH, M.A.
E. H. ARCHIBALD,
M. VIOLETTE DOVER, B.A., M.SC.
LECTURE-ASSISTANT :—LOUIS C. GRATON, B.SC.

Second Year.

1. GENERAL CHEMISTRY.—A Course of lectures on Elementary Chemical Theory, and on the principal elements and their compounds. The lectures are fully illustrated by means of experiments.
Text-book :—Newth's Text-book of Inorganic Chemistry.
Three hours a week.

ELEMENTARY PRACTICAL CHEMISTRY.—This course is compulsory for all undergraduates taking the above course of lectures. The work includes experiments illustrative of the Laws of Chemical Combination, the Preparation of Pure Chemical Compounds, and elementary Qualitative Analysis.
Six hours a week.

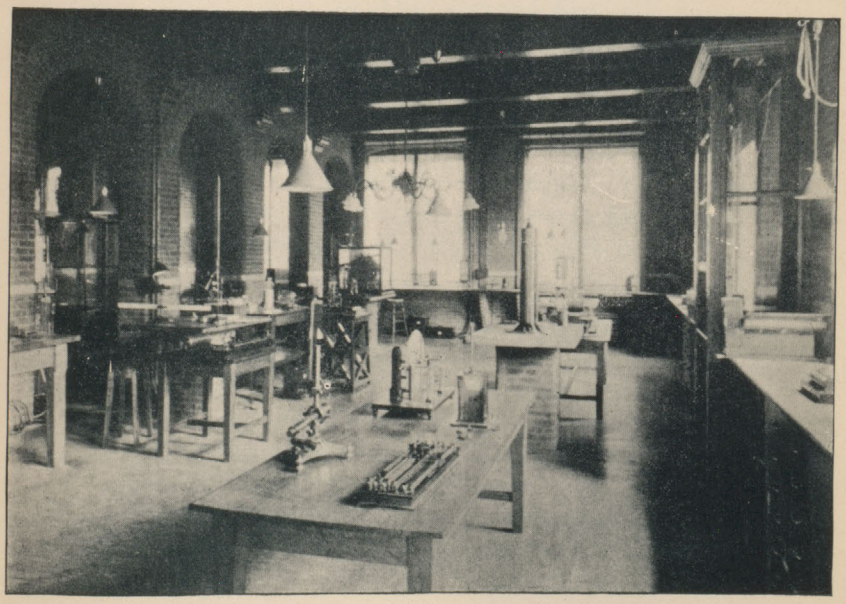
Third Year.

2. INORGANIC CHEMISTRY.—An elementary course on special departments of Inorganic Chemistry.
Two hours a week during the first term.

3. ELEMENTARY ORGANIC CHEMISTRY.—An elementary course of lectures on Organic Chemistry open to Biological Students and compulsory for students intending to take the advanced course on Organic Chemistry in the Fourth Year.
Two hours a week during the second term.



Macdonald Physics Building.—Departmental Library.



Macdonald Physics Building.—An Electrical Laboratory.

4. Advanced Practical Chemistry.—Laboratory practice in methods of gravimetric, volumetric and electrolytic Quantitative Analysis, during the first term, and preparation of simple Organic Substances in the second term.

Note.—Extra reading and laboratory work will be required from Honours Students.

The Organic Laboratory will be open during the Second Term for Biological Students who desire to obtain an elementary knowledge of the methods employed in preparing Organic Substances.

5. Organic Chemistry.—A systematic course of lectures on Organic Chemistry, including the Analysis of Organic Substances, Calculation of Formulæ, Determination of Molecular Weights, Polymerism, Isomerism, etc., followed by a discussion of the more important derivatives of the Aliphatic and Aromatic Series of Compounds. Students intending to enter the Medical Faculty would find this course of great advantage. Two hours a week. **Fourth Year.**

6. Practical Organic Chemistry.—A complete course on the perparation and analysis of Organic Substances, with determinations of Molecular Weights, etc.

7. Physical Chemistry.—The lectures on Physical Chemistry are divided into two parts. In the first term they include a study of such physical properties of gases, liquids, and solids as are known to depend upon their Chemical Constitution, Thermo-chemistry and the Law of Mass Action. The second term is devoted to Electro-chemistry. The lectures will be based upon the application of the gaseous laws to solutions.

8. Practical Physical Chemistry.—Laboratory work will include the various methods of determining the Molecular Weights of gases and of substances in solution, accurate measurement of Densities, Refractive Indices, Surface Tensions and Specific Rotations; also examples of Chemical Statics and Kinetics, and Electro-chemical measurements.

). Mineral Analysis.—A course of laboratory work comprising advanced quantitative analysis and investigation of the constitution of mineral species.

Honour Courses. Third Year. (1) Chemistry, 2, 3, 4; (2) Experimental Physics; (Course 7); (3) Mechanics (Course 6 A); (4) Differential and Integral Calculus (4 hours a week for the first half of second term or 2 hours a week for whole term), with Biology, or Geology, or Mineralogy.

Fourth Year. (1) Chemistry, 5, 6, 7, 8; or 7, 8, 9; (2) Experimental Physics (Course 8).

Mineralogy.

Professor:—B. J. Harrington, M.A., Ph.D.

Demonstrator:—

Honours. Third Year 1. Mineralogy.—Lectures and demonstrations illustrated by models and specimens in the Peter Redpath Museum and the Macdonald Chemistry and Mining Building. Among the subjects discussed are: Crystallography; physical properties of minerals dependent upon light, electricity, state of aggregation, etc.; chemical composition, calculation of mineral formulæ, quantivalent ratios, etc.; principles of classification, description of species.

Two hours a week.

Fourth Year 2. Mineralogy (In continuation of No. 1).—Description of species, particular attention being paid to those which are important as rock constituents and to the economic minerals of Canada.

First term, two hours a week.

3. Determinative Mineralogy.—Laboratory practice in blowpipe analysis and its application to the determination of mineral species. This work is carried on in the new laboratory provided for the purpose in the Chemistry and Mining Building.
Thursday, 2 to 5 p.m.

Third Year.

Elementary Biology.

Professors :—D. P. Penhallow, M.Sc.
E. W. MacBride, M.A., D.Sc.

1. This course is designed for those who may wish an introduction to the principles of general biology, but who cannot carry such work beyond the limits of an elementary course; for students in Arts proceeding to Medicine, and also for those who may wish to take the more advanced work of the Third and Fourth Years to which it will be introductory.

Second Year. Elementary Biology.

A. Zoology.—First half session. This course will commence the study of a selected number of types, leading up to and including the rudiments of vertebrate anatomy and forming an introduction to the more systematic work of the Third and Fourth Years. The types selected are Amœba, Paramœcium, Hydra, Lumbricus, Scyllium, and Rana.

B. Botany.—Second half session. A course in the general morphology of plants embracing a discussion of the general principles of morphology and classification, respiration, photosynthesis, nutrition, reproduction, symbiosis and adaptations, as also the relations of plants in geological time. These studies will be illustrated by means of special types taken from the principal groups, and emphasis will be given to a study of the flowering plants, including herbarium work, determination of species and geographical distribution.

This course is designed with special reference to those who may not be able to carry such work beyond the limits

of an elementary course, where it will form the basis for more specialized work in the Third and Fourth Years.

Two lectures and two laboratory periods each week.

C. Continuation Course in Animal Biology.—Students taking the combined six-years course leading to the degrees of B.Sc. and M.D. may, in lieu of B., take the folloving course:—

A study of the anatomy and osteology of the Rabbit followed by a detailed study of microscopic structure of its tissues.

Two lectures and two laboratory periods a week during the spring term.

Botany.

Professor:—D. P. Penhallow, M.Sc.
Lecturer:—C. M. Derick, M.A.

Second Year.

1. Plant Biology. (See page 133). This course s introductory to the more specialized work of the Third and Fourth Years, and will be represented by a number of types, including the flowering plants and a determinatioı of species.

Two lectures and two laboratory periods each week during the spring term.

2. Special Morphology. This course is designed tc give a comprehensive knowledge of plant structures and relationships. The principles of development will be illustrated by type studies which may also serve as the basis of more special work in Bacteriology, Physiology, Ecology, or Paleobotany. It comprises:—

(*a*) Microscopy, including determination of amplifications, micrometry, drawings, section cutting, the preparation of microscopic objects.

This work presupposes familiarity with the optics of the microscope as given in Physics (3) of the Second Year

(*b*) Critical studies of the Thallophyta, Bryophyta and Pteridophyta as illustrated by selected types.

Two lectures and two laboratory periods each week throughout the session.

Ordinary. Fourth Year.

3. Special Morphology. This course embraces a critical study of the seed plants in continuation of the work of the Third Year, and it is open to undergraduate students only after having satisfactorily completed the latter. Partial students may take this course provided they show suitable qualifications.

The work will be based upon selected types of seed plants, and will embrace a study of the anatomy, cell products and embryology—with special reference to adaptations and relationships—and exercises in practical morphology, field and herbarium work.

Two lectures and two laboratory periods each week throughout the session.

For the work of the Third and Fourth Years, each student will be required to provide himself with a laboratory syllabus and drawing book of specified form.

B.A. Honour Course in Biology.

Honours. Third Year.

4. Candidates for Honours in the Third Year will, in addition to the ordinary work of that year, take a special course of reading under the direction of the professor, who will hold a colloquium once each week for the purpose of giving advice and direction in such work.

For the Session of 1902-1903, the special readings will include:—Henslow's Origin of Plant Structures (Autumn term) and Campbell's Evolution of Plants (Spring term), together with such special monographs as may be selected.

Honours. Fourth Year.

5. Candidates for Honours in the Fourth Year will take a course in experimental plant physiology based upon the following works:—

Pfeffer, Plant Physiology; MacDougall, Experimental Plant Physiology; Darwin and Acton, Practical Physiology of Plants.

Special essay work upon the experiments performed will be assigned from time to time during the session.

Students will not be permitted to take this course unless they have previously taken the course prescribed for the Second Year.

One lecture and six laboratory hours per week.

B.Sc. Course.

Ordinary. Third Year.

6. Students proceeding to the degree of B.Sc. will be required to take the ordinary course of the Third Year Arts, (2) and also one-half of the Honour course for that year (4).

Two lectures and two laboratory periods each week throughout the session.

Colloquium one hour per week during the spring term.

Fourth Year.

During the Fourth Year, students proceeding to the degree of B.Sc. will be required to pursue special studies in extension of the work of the Fourth Year, Arts, (3) in accordance with such plan as may be adopted by the B.Sc. Committee at the time of his entrance upon that year.

Zoology.

Professor :—E. W. MacBride, M.A., D.Sc.

Lecturer :—J. Stafford, M.A., Ph.D.

Ordinary. Biology. Second Year

1 A. Animal Biology (see Biology, p. 133).

This course includes a careful study of the laws of Biology as illustrated by a selected series of types. Special stress is laid on the study of the elements of vertebrate anatomy and physiology, to which the most of the time is devoted. The types studied are Amœba, Paramœcium, Hydra, Lumbricus, Scyllium and Rana.

This course, together with the corresponding course in Botany, constitutes the course in General Biology. It can, however, be taken along with 1 B instead of Botany, by students who are taking the combined six-year course in Arts and Medicine leading to the degrees of B.Sc. and M.D.

Two lectures and two demonstrations a week during the autumn term.

1 B. Continuation Course in Animal Biology.—This course comprises a further study of vertebrate anatomy, including a detailed study of the tissues. The type selected is the Rabbit, of which the osteology and gross anatomy are first studied, and then the finer structures of the tissues. The practical work includes instruction in the staining and mounting of sections.

Two lectures and two demonstrations a week during the spring term.

2 A. General Zoology.—This course consists of a general survey of the principal classes of animals. It is specially suited to the requirements of those who intend to take geology, and the structure of fossil species is studied along with that of their living representatives.

Ordinary Third or Fourth Year.

Two lectures and two demonstrations a week throughout the session.

2 B. Special Zoology.—This course comprises:—

Ordinary. Third or Fourth Year.

(*a*) A special study of those groups in the animal kingdom, the members of which are concerned in producing disease.

(*b*) A study of the comparative anatomy of the Vertebrata, with special reference to the osteology.

(*c*) A study of Comparative Embryology, with special reference to the Vertebrata, forming an introduction to Human Embryology.

Two lectures and two demonstrations a week throughout the session.

Students are required to have taken 1 A and either 1 B or 2 A before proceeding to 2 B. It is in most cases advisable that 1 A should be taken before proceeding to 2 A; but it is possible for the student, by a certain amount of extra laboratory work, to cover the ground required for 2 A, even if 1 A has not been taken.

For the courses 2 A and 2 B a study of Shipley and MacBride's Text-book of Zoology is required.

It is also advisable that a study of this text-book should accompany course 1 A.

Honour Course in Biology.

Honours. Third Year.

[For the Botanical portion of this course, see p. 135.]

3. During the Third Year, students pursuing the honour course in Biology will take the course 2 A, and in addition pursue a course of reading under the direction of the Professor. The Professor will once a week hold a colloquium in order to supervise the studies of honour students.

The books studied during 1902-1903 will be: Darwin, Origin of Species, and Balfour, Comparative Embryology, Vol. I.

Honours. Fourth Year.

4. During the Fourth Year, honour students will take courses 1 B and 2 B, and pursue in addition a course of extra reading, supervised, as in the Third Year, by the Professor.

The books studied during 1902-1903 will be: Verworn, General Physiology, and Wallace, Island-Life.

No student is permitted to attend the lectures without taking the practical work. For use in the laboratory, a special note-book and a set of dissecting instruments are required, and will be supplied to the student, who is required to pay a fee of $2.50 to cover the cost of these.

Geology.

PROFESSOR :—FRANK D. ADAMS, M.A.Sc., PH.D.
DEMONSTRATOR :— ALFRED W. G. WILSON, B.A., PH.D.

Ordinary. Third Year.

1. General Geology.—The lectures will embrace a general survey of the whole field of Geology, and will be introduced by a short course on Mineralogy. Especial attention will be devoted to Dynamical Geology and to Historical Geology including a description of the fauna and flora of the earth during the successive periods of its past history.

The lectures will be illustrated by the extensive collections in the Peter Redpath Museum, as well as by models, maps, sections and lantern views. There will be an excursion every Saturday until the snow falls, after which the excursion will be replaced by a demonstration in the Museum.

Text-book:—Scott, An Introduction to Geology.

Books of Reference:—Dawson, Hand-Book of Geology; Dana, Manual of Geology.

Three hours a week throughout the year, with additional excursions and demonstrations as above stated.

Honour Course in Geology and Mineralogy.

[For Mineralogical portion of this course see p. 132.]

In the Third Year, students pursuing the Honour Course will take the Ordinary work (General Geology, 1).

In the Fourth Year they will take following courses (2, 3, 4, 5, 6 and 7).

Honours. Fourth Year.

2. Petrography.—The modern methods of study employed in Petrography are first described, and the classification and description of rocks is then taken up.

One lecture a week during the first term. One afternoon a week throughout the year will be devoted to special microscopical work in the Petrographical Laboratory.

Text-book:—Harker, Petrology for Students.

Books of Reference:—Rosenbusch, Mikroskopische Physiographie, and Rutley, Rock-forming Minerals.

3. A. Palæontology.—An extension of the Palæontology of Course 1, with special studies of some of the more important groups of fossils.

One lecture a week during the second term and one demonstration a week, with special studies in the Peter Redpath Museum.

Books of Reference :—Nicholson and Lydekker, Manual of Palæontology; Zittel, Text-Book of Palæontology.

or,

3. B. Physiography.—A description of Land Forms with reference to classification, drainage development, climatic and human control.

The physical features of Canada will be described during the latter half of the course.

One lecture and one demonstration a week during the second term.

The course will be illustrated by models, maps and lantern slides.

In the session of 1902-3 course 3 B., but not 3 A., will be given.

4. Ore Deposits and Practical Geology.—The nature, mode of occurrence and classification of ore deposits will first be discussed, and a series of typical occurrences will then be described. The methods employed in carrying out Geological Surveys, and in preparing Geological Sections will then be taken up, with special studies in folding, faulting, etc.

One lecture or demonstration a week throughout the year.

Text-books:—Geikie, Outlines of Field Geology ; Kemp, Ore Deposits of the United States. Phillips and Louis, A Treatise on Ore Deposits.

Books of Reference:—The Monographs of the U.S. Geological Survey.



Royal Victoria College for Women.

5. Canadian Geology.—A general description of the Geology and Mineral Resources of the Dominion.

One lecture a week during the second term.

Text-book:—Dawson, Hand-book of Geology.

Books of Reference:—The Reports of the Geological Survey of Canada.

6. Geological Colloquium.—A discussion each week of some Geological topic, references to the literature of which have been given by the Professor in the week preceding. The course is intended to give students some acquaintance with Geological literature, as well as a wider knowledge of the great principles which underlie the Science.

One hour a week in second term.

7. Geological Survey.—Candidates for Honours in the Fourth Year will also undertake, under the direction of the Demonstrator in Geology, a Geological Survey of some suitable area selected for that purpose. This Survey will occupy two weeks, and will be made either at the close of the Third Year or immediately before the opening of the regular work of the Fourth Year, as may be arranged by the Professor of Geology. The preparation of a geological map of the surveyed area, the examination of the specimens collected, and the writing of a detailed report upon the area, will form part of the work of the Fourth Year.

N.B.—A large amount of additional private reading will also be required of Candidates for Honours.

Students taking any of these courses are entitled to tickets of admission to the Museum of the Natural History Society of Montreal.

Course for B.A. Honours in Geology and Mineralogy.

Third Year.—(Geology (ordinary of Third Year).
Mineralogy.
Zoology (ordinary of Third Year).
Chemistry (of Second or Third Year).

Fourth Year.—Geology (Advanced)—Lectures, Lab. work, Field work, Colloquium, Reading.)
Mineralogy (Advanced).
Botany (ordinary of Second Year).

Meteorology.

SUPERINTENDENT OF OBSERVATORY :—C. H. McLEOD, MA.E.

Instruction in Meteorological Observations will be given in the Observatory at hours to suit the convenience of the senior students.

Certificates will be granted to those students who pass a satisfactory examination on the construction and use of meteorological instruments and on the general facts of Meteorology.

Pedagogy.

LECTURER :—PRINCIPAL S. P. ROBINS, M.A., LL.D.

Lectures on this subject will be given in the Normal School to undergraduates of the Third and Fourth Years, who wish to obtain the Provincial Academy Diploma.

Lecture hours, Tuesdays and Fridays, 2 to 3.

Physical Training.

MEDICAL DIRECTOR OF PHYSICAL TRAINING :—
R. TAIT MCKENZIE, B.A., M.D.

The classes will meet at the University Gymnasium at hours to be announced at the commencement of the Session. The Wicksteed Silver and Bronze Medals (the gift of Dr. R. J. Wicksteed) are offered for competition to students of the Graduating Class and to students who have had instruction in the Gymnasium for two sessions,—the silver medal to the former, the bronze medal to the latter. (See page 43.)

VIII. Laboratories.

The Macdonald Physical Laboratories.

The equipment of the Macdonald Physical Building Laboratories comprises: (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the Students in practical work; (3) the most recent types of all important instruments for exact measurement, to be used in connection with special work and research.

The basement contains the cellars, furnaces, and janitor's department at the west end of the building. The machine room—containing a small gas engine and dynamo, which are fitted for testing, but can also be used for light and power, a motor-alternator and a motor-dynamo—is situated at the extreme western corner of the basement so as to be as far removed as possible from the delicate magnetic and electrical instruments. Here is also the switch board for controlling the various circuits for supplying direct or alternating current to different parts of the building. The Accumulator Room contains a few large storage cells, charged by the motor-dynamo, which are fitted with a suitable series-parallel arrangement and with rheostats for obtaining and controlling large currents up to 4,000 amperes for testing ammeters and low resistances, etc.

The Magnetic Laboratory contains magnetic instruments and variometers of different patterns, and also a duplicate of the B. A. Electro-dynamometer, which has been completely remodelled and set up with great care for absolute measurements of current. The Laboratory, on the opposite side of the basement, contains a very fine Lorenz apparatus for the absolute measurement of resistance, constructed under the supervision of Prof. Viriamu Jones. It also contains a set of Ewing Seismographs and a pair of Darwin Recording Mirrors for measuring small movements of the soil.

There is a Constant Temperature Room, surrounded by double walls, which contains a Standard Rieffler Clock, and is fitted for comparator work.

The ground floor contains at the western corner a small machine shop, fitted with a milling machine and suitable lathes and tools, driven by electric motors, and such appliances as are required for the making and repairing of the instruments, for which the services of a mechanical assistant are retained. There is also a store room for glass, chemicals and cleaning materials, and extensive lockers and lavatories for the use of the students.

The Main Electrical Laboratory is a room 60 feet by 40, and is fitted with a number of brick piers, which come up through the floor, and rest on independent foundations, in addition to the usual slate shelves round the walls. This room contains a large number of electrometers, galvanometers, potentiometers and other testing instruments of various patterns, and adapted for different uses. It connects with a smaller room at the side, in which are kept the resistance boxes and standards, and also the capacity standards. A

small research laboratory, adjoining the electrical laboratory, is fitted up for the study of electrical discharge in high vacua, and for work with Röntgen and uranium radiation, and with ultra-violet light.

The First Floor contains the Main Lecture Theatre, with seats for about 250 students. The lecture table is supported on separate piers, which are independent of the floor. Complete arrangements are provided for optical projections and illustration. The Preparation Room in the rear contains many of the larger pieces of lecture apparatus, but the majority of the instruments, when not in use, are kept in suitable cases in the adjoining apparatus room. On the same floor there is the Heat Laboratory, devoted to advanced work in Thermometry, Pyrometry and Calorimetry, and also to such electrical work as involves the use of thermostats and the measurement of the effects of temperature. There are also two smaller rooms for Professors and Demonstrators.

The Second Floor is partly occupied by the upper half of the Lecture Theatre. There is also an Examination Room for paper work, a Mathematical Lecture Room, with a special apparatus room devoted to apparatus for illustrating Mathematical Physics, and a special Physical Library chiefly devoted to reference books and periodicals relating to Physics. A store room, lavatories and Professors' Room occupy the remainder of the flat.

The Third Floor contains the Elementary Laboratory, a room 60 feet square, devoted to elementary practical work in Heat, Sound and Electricity and Magnetism. There is a Demonstrator's room adjoining, and an optical annex devoted to experiments with lenses, galvanometers, etc., which require a darkened room. On the other side of the building there is a spectroscopic room containing a six-inch Rowland grating, with mountings by Brashear, and other large spectrometers and polarimeters. Also a series of smaller optical rooms, including a photometric room, specially fitted for Arc photometry, and a dark room for photographic work. Communication between the different flats is facilitated by means of a hydraulic elevator. The building is lighted throughout by electricity, and heated by hot water. The walls are of pressed brick, and the floors of hard maple. There is a ventilating system, consisting of Tobin tubes and suitable exit flues, assisted by a fan in the roof.

The Macdonald Chemical Laboratories.

The main lecture-theatre, extending through two stories, is entered from the ground floor, and seats nearly 250 students. The lecture-table is supplied with coal-gas, oxygen and hydrogen, electricity, water, vacuum, down-draught, etc., and can be well seen from all parts of the room.

Besides the main lecture-theatre, there are three smaller class-rooms, accommodating from 40 to 60 students each.

The three principal laboratories have each a floor-space of about 2,400 square feet, and together have accommodation for nearly two hundred students working at a time. They are lighted on three

sides, and have ample board space. One is intended for beginners, and the others for more advanced work, more particularly in qualitative and quantitative analysis. In connection with each of the main laboratories is a balance-room, equipped with balances by several of the best makers.

Physical Chemistry is provided for in a special laboratory, nearly 30 by 40 feet, lighted from the north, and supplied with electricity, steam, vacuum pumps, etc. The equipment of this department consists of the apparatus necessary for the determination of the specific gravities of solutions, of the depression of freezing point, and the rise of boiling point, of the densities of gases and vapours. There are constant temperature baths for accurate measurement of solubilities, Kohlrausch's apparatus for determining the electrical conductivity of solutions, and the apparatus necessary for measuring the electromotive forces generated between metals and their solutions, and in voltaic cells generally. There are also calorimeters for measuring the heat effects produced in chemical reactions. There is on the same floor an optical room furnished with refractometers for measuring the refractive indices of solutions, goniometers, polariscopes and spectroscopes. Other forms of apparatus will be added as required for research work.

Immediately adjoining the laboratory of Physical Chemistry is the Photographic department, supplied with two dark rooms, arranged on the maze system, and supplied with the necessary appliances for all ordinary photographic work, including an enlarging camera. Apparatus for micro-photography will shortly be added to the equipment.

The laboratory for Gas Analysis has a northern exposure, and is fitted with a large tank, to contain water at the temperature of the room, for use in the measurement of gases. The tables are arranged for work with mercury, and the laboratory is supplied with the apparatus of Hempel, Dittmar, Orsat, Elliot, and others. It contains also Fleuss, Boltwood and Töpler pumps for providing high vacua.

The laboratory for Electrolytic Analysis is supplied with accumulators, thermopile, platinum electrodes, rheostats, ammeters, voltmeters, etc.

Another room has lately been equipped with electric furnaces and other appliances for electro-chemical work.

The Organic Department comprises a laboratory for preparations and research, a combustion room for analysis, a dark room for polariscope and saccharimeter work, and a lecture room. The laboratory is fitted with all the necessary apparatus for organic research—special hoods for work with poisonous gases, regulating ovens for digesting and drying at various temperatures, filter presses for the extraction of raw materials, and various forms of apparatus for distillation in vacuo. The dark room is equipped with polariscopes and saccharimeters for sugar work. There is a large quantity of the necessary organic chemicals, which are supplied free of charge to students engaged in routine or research work in this department.

The laboratory for Determinative Mineralogy has places for 28 students, and is supplied with abundant material for practical work. It adjoins the lecture-room, in which the lectures on advanced mineralogy are delivered. The mineralogical department is also provided with suitable machinery, run by electricity, for cutting and polishing minerals.

The Library contains a valuable collection of the most recent English, French and German books, and sets of various journals and transactions, including the Berichte der Deutschen Chemischen Gesellschaft, Journal für praktische Chemie, Chemisches Central-blatt, Fresenius' Zeitschrift für Analytische Chemie, Zeitschrift für Anorganische Chemie, Annales de Chimie et de Physique, Journal of the Chemical Society, Journal of Physical Chemistry, American Chemical Journal, Chemical News, Zeitschrift für physikalische Chemie, Zeitschrift für Elektrochemie, Mineralogische und Petrographische Mittheilungen, etc. The library is open to students under such restrictions as are necessary to prevent damage or loss of books.

The rooms for allied purposes have, as far as possible, been grouped together on the same floor, and there is a hydraulic lift running from the basement to the attic. The offices and principal laboratories and supply rooms are also connected by a system of telephones. The building is practically fire-proof.

Botanical Laboratories.

The Botanical Laboratories occupy the upper floor of the central Arts building.

The laboratory for general Morphology provides table accommodation for twenty students, and is equipped with all the necessary appliances for the practical study of plants, either fresh or dry.

In connection with this laboratory, a large collection of dried plants is maintained, from which material is drawn for practical work.

The laboratories for special Morphology at present afford accommodation for twelve students. Each table is provided with a complete outfit of instruments and reagents. Provision is also made for accurate micrometric work, and for the production of accurate drawings by means of the camera lucida and Leitz's drawing instrument. More special instruments, including polariscope, spectroscope and photographic apparatus, afford opportunity for detailed studies in these several directions.

Ample provision for material of all kinds is found in the resources of the Botanic Garden, and in a large supply of stock preparations.

An investigator's table held by the University at the Biological Laboratory, Wood's Hall, Massachusetts, is available for such students as may successfully complete the advanced course of the Third and Fourth Years.

Zoological Laboratories.

The Zoological Department occupies the whole of the uppermost floor of the east wing of McGill College and the larger portion of the floor immediately below.

It consists of :

(*a*). A large laboratory affording accommodation for a class of 90 students.

(*b*). A smaller laboratory capable of seating about 18 students.

(*c*). Three smaller laboratories fitted up for purposes of research.

(*d*). A room fitted up for the University Osteologist.

Dissecting trays, simple and compound microscopes, reasonable quantities of the ordinary reagents and of glass are provided by the department, but students must provide themselves with dissecting instruments, and with razors.

The Department is provided with four large tanks and a number of smaller ones in order to maintain a supply of fresh specimens throughout the winter.

The subjects for practical work, are, so far as possible, selected from species inhabiting the vicinity of Montreal.

The laboratories are well provided with thermostats, microtomes, and other instruments required for advanced research. There is also a small library attached to the department.

A complete set of apparatus for microphotographic work has recently been added to the equipment of the laboratory.

Petrographical Laboratory.

The Petrographical Laboratory, containing the chief rock collections of the University, is situated in the Macdonald Chemistry and Mining Building, and is arranged for the use of Honour and Graduate students. It is provided with a number of petrographical microscopes by Seibert and Crouch, as well as with models, sets of thin sections, electro-magnets, heavy solutions, etc., for petrographical work.

For purposes of study and comparison, in connection with advanced work and petrographical investigation, Dr. Adams' extensive private collection of rocks and thin sections is available.

TIME TABLES.—FACULTY OF ARTS.

FIRST YEAR—MEN.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Latin.	Math.	Math.	French.	Math.	
10	French.	Greek.	Latin.	Greek.	Greek.	
11	Math.	French.	English.	German.	English.	
12	Physics.	German.	German.	Latin.	Physics.	
2	Greek.	English.	French.	English.	Latin.	
3	English.				German.	
4						
5						

FIRST YEAR—WOMEN.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Greek.	Physics.	Greek.	Greek.	Greek.	
10	English.	English.	French.	French.	Math.	
11	German.	Math.	Latin.	English.	French.	
12	Latin.	Latin.	Math.	German.	Latin.	
2	Math.	French.	English.	Physics.	German.	
3			German.		English.	
4						
5						



Macdonald Engineering Building.

SECOND YEAR—MEN.

Hours.	Monday	Tuesday	Wednesday	Thursday.	Friday.	Saturday
9	German. Hebrew.	Logic.	German. Hebrew.	Logic.	French.	Chem. Lab.
10	Latin	Latin.	Greek.	German. Hebrew.	Hebrew. German.	Chem. Lab.
11	Math.	Chemistry.	French.	Latin.	Math.	Biol. Lab. (*b*) (Botany).
12	English.	Greek.	Chemistry.	English.	Chemistry.	Biol. Lab. (*b*) (Botany).
2	Greek.	Biology.	English	Math.	Biology.	
3	Chem. Lab.	Biol. Lab. (Zoology).	Latin.	French.	Biol. Lab. (Zoology).	
4	Chem. Lab.	Biol. Lab. (Zoology).	Logic. Biol. Lab. (*b*) (Botany).	Greek.	Biol. Lab. (Zoology).	
5	Chem. Lab.	French.	Biol. Lab. (*b*) (Botany).			

SECOND YEAR—WOMEN.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Latin.	Greek.	French.	Math.	Greek.	Chem. Lab.
10	German.	Math.	Math. Chem. Lab.	Latin.	German.	Chem. Lab.
11	Logic	Chemistry.	Greek. Chem. Lab.	English.	Latin.	Biol. Lab. (*b*) (Botany).
12	English	Logic.	Chemistry.	Logic.	Chemistry.	Biol. Lab. (*b*) (Botany).
2	French.	French.	Latin.	French.	English.	
3	Greek.	Biol. Lab. (Zoology . Chem. Lab.	Biology.	German.	Biol. Lab. (Zoology).	
4	Biology.	Biol. Lab. (Zoology). Chem. Lab.	Biol. Lab. (*b*) (Botany).	Greek.	Biol. Lab. (Zoology).	
5		German.	Biol. Lab. (*b*) (Botany).			

(*b*) During Second Term.

PRIMARY COURSES (THIRD AND FOURTH YEARS).

		Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
	9	Geology. Sanskrit. Hist. of Philos. Mechanics.	Chem. History. Greek.	Geology. Sanscrit. Astr. (*a*) Opt. (*b*) Hist. of Philos	Latin. Hebrew. German.	Zoology. Pol. Science.	Chem. Lab. Geol. Lab.
	10	Botany. English. Mathematics Physics (*B*).	Eng. Comp. III.	Latin. Hebrew. German.	Botany. English. Math. Physics (*B*)	Geology. Sanskrit. Hist. of Phil. Ast. (*a*) Opt. (*b*)	Chem. Lab. Geol. Lab.
	11	Chemistry. History. Greek.	Latin. Hebrew. German.	Zoology. Polit. Science.	Chemistry. History. Greek.	Latin. Hebrew. German.	Chem. Lab. Geol. Lab.
	12	Moral Philos. French. Economics.	Physics (A) Moral Philos. French. Economics.	Eng. Comp. IV.	Physics (*A*) Moral Philos. French. Economics.	Moral Philos. French. Economics.	Geol. Lab.
	2	Zool. Lab. Comp. Phil. Chem. Lab. Polit. Science Physics Lab.	Pædagogy. Bot. Lab. Hist. of Phil.: Sanskrit. Mechanics.	History. Greek. Chem. Lab.	Zool. Lab. Physics Lab. Comp. Phil. Pol. Science.	Pædagogy Bot. Lab.	
	3	Zool. Lab. Chem. Lab. Physics Lab.	English. Bot. Lab. Mathematics.	Chem. Lab.	Zool. Lab. Physics Lab.	Bot. Lab. English. Mathematics	
	4	Art & Arch.: Logic & Met. Roman Law. Chem. Lab.	Logic & Met. Roman Law.	Roman Law. Bot. Lab. Chem. Lab.	Art & Arch. Logic & Meta. Roman Law.	Logic & Met. Rom Law (*b*) Cons. Law (*a*)	
	5	Econ. Hist. Const. L. & H.	Const. L. & H.	Bot. Lab.	Econ. Hist. Const. L. & H.	Const. L. & H.	

(*A*) Heat, Light and Sound.

(*B*) Magnetism and Electricity.

(*a*) During First Term. (*b*) During Second Term.

N.B.—The term Primary Course denotes the first course taken in the subject subsequent to the Intermediate Examination, whether in the Third or Fourth Year.

DATE.	Hour.	Matriculation.	First Year Exhibitions.	Supp. to First Year Sessional.	Second Year Exhibitions.	Supplemental to Intermediate.	Scholarships (Third Year).	Supp. to Third Year Sessional.
Wed. 10	9	Latin Books and Sight Translation.	Latin Books and Sight Translation.	Latin Books.	Latin Books and Sight Translation.	Latin Books.	Latin Books, Math. (Anal. Geom. (1).)	Latin Books.
	2	Latin Grammar and Composition.	Latin Gram., Composition, Higher Composition and Sight Translation.	Latin Composition, Sight Translation and History.	Latin Composition, Grammar and History.	Latin Composition, Sight Translation, History and Literature.	Latin Composition and Sight Translation.	Latin Composition, Sight Translation, History and Literature.
Thurs. 11	9	Mathematics Pt. I (Euclid.)	Mathematics Pt. I (Euclid I–IV).	Mathematics.	Mathematics, (Eucl., Alg., Trig.)	Mathematics.	Math. Anal. Geom. (2)); Anc. History; Chem.	Mathematics.
	2	Mathematics Pt. I (Alg. and Arith.)	Mathematics Pt. I (Alg. and Arith.)	Mathematics.	Mathematics, (Geometry.)	Mathematics.		
Fri. 12	9	English Grammar and History.	English Grammar.	English Literature, History and Composition.	English Literature (Spenser & Tennyson) & Composition.	English Language, Literature and Composition. Logic.	English Literature (Shakespere and Milton), Logic.	English.
	2	English Literature, Dictation and Composition.	English Literature. (Scott, Shakespere and Milton).			Biology.	English Literature (Charles Lamb) and Composition; Chem.	
Mon. 15	9	French.	French.	French.	French.	French.	Math. Calculus); French; Chemistry	French: Botany.
	2	German.	German.	German.	German.	German.	German.	German.
Tues. 16	9	Mathematics Pt. II.	Mathematics Pt. II.	Physics.	Mathematics, (The. of Eq., Alg.)	Mathematics.	Mathematics, (Higher Alg., Trig.)	Mathematics.
	2	Elementary Nat. or Phys. Science.	English Literature (Macaulay) and Composition.		Modern History and English Language (Trench).	Chemistry.	Modern History, Chemistry.	
Wed. 17	9	Greek Books and Sight Translation.	Greek Books and Sight Translation.	Greek Books.	Greek Books and Sight Translation.	Greek Books.	Greek Books.	Greek Books.
	2	Greek Grammar and Composition.	Greek Gram., Composition, Higher Composition and Sight Translation.	Greek Composition, Sight Translation and History.	Greek Composition, Grammar and History.	Greek Composition, Sight Translation, History and Literature.	Greek Composition and Sight Translation.	Greek Composition, Sight Translation, History and Literature.
Thurs. 18	9		English Literature, (Morley.)					

CHRISTMAS EXAMINATIONS, DECEMBER 1902.*

Day.	Date	First Year.	Second Year.	Third Year.	Fourth Year.
Monday.	15	Latin.	Latin.	Mechanics.	Astronomy.
"	15		M'matics, P.M.	German.	German.
Tuesday.	16	Greek.	Greek.	Greek.	Greek.
"	16		English.	Zoology, P.M.	Geology, P.M.
Wednesday.	17	Mathematics.	Psychology.	Moral Phil.	Moral Philosophy.
"	17	French, P M.	French, P.M.	Latin.	Latin, P.M.
Thursday.	18	Physics.	Chemistry.	Botany.	Botany.
"	18	German. P.M.	German, P.M.	French, P.M.	French, P.M.
"	18		Hebrew, P.M.	Hist. of Phil.	Hist. of Phil.
Friday.	19	English.	Biology, P.M.	Logic.	Logic.

* The Christmas Examinations are obligatory on all Undergraduates, and on Partials desiring to be Undergraduates, and the standing gained therein will be taken into account by the Faculty at the close of the session. The results will be made known after the Christmas vacation.

The above time table is subject to modification, especially in regard to the Third and Fourth Years.

Royal Victoria College.

The institution of the Royal Victoria College, in September, 1899, was a direct continuation of the work begun in 1883, during the Principalship of the late Sir William Dawson, when Lord Strathcona and Mount Royal placed a sum at the disposal of the University of McGill, for the Endowment of a College and classes for women. For many years previously it had been hoped by those interested in the education of women in Montreal that the University would extend its benefits to women, but the means necessary for carrying out such an aim had not been available. The classes were organized in 1884 as a Special Course in the Faculty of Arts, held at McGill College, separate in the main from those for men, but under identical conditions. In some of the work of the Third and Fourth Years, and in the Honour and Additional Courses, the classes were held jointly.

The ultimate aim of Lord Strathcona had been the foundation of a place of residence, and, with this object, he announced his intention of building and endowing the Royal Victoria College. By the opening of this Institution the opportunity of residence and college life is given to women-students of McGill University, working in accordance with the system previously organized in the Special Course in Arts, but under greatly improved conditions. A share in the advantages of college life is offered also to the non-resident women-students of the University, who are henceforth also students of the Royal Victoria College. Additional elements have been added in the organization of a Musical Department, and in the institution of Resident Women Tutors. These additions are in accordance with the general aim of the College; viz., the higher education of women, and mainly to

qualify them to take degrees in Arts (including Pure Science), and to provide them with instruction in those branches of a liberal education necessary thereto and in such other subjects as may from time to time be determined.

The College being a residential College for the Women-Students of McGill University, its students, whether Undergraduates, Conditioned Students, or Partial, follow the courses in Arts and Pure Science offered by the University, (see pp. 83-142). Lectures are given by the Professors and Lecturers of the University, either in the College or in the University buildings, and students attend the University Laboratories for practical instruction. In addition to the instruction given in lectures and laboratory practice, the students of the Royal Victoria College are assisted in their studies by the Resident Tutors.

Exhibitions and Scholarships.

For a statement of the Exhibitions and Scholarships open to Women Students of the University, see pp. 47, 57 and 59.

In addition to these, and further to encourage residence within the College walls of students who might otherwise arrange to board in the city, the Warden and Faculty are empowered to make nominations in any of the four College years to not more than three additional Exhibitions of the value of $100 each.

Music.

Apart from the University Courses, instruction in Music is offered at the College, for which a separate fee is charged. The instruction includes the Pianoforte in all its branches (solo, ensemble playing, concertos, duos for two pianofortes); Singing (voice production, vocalization, sight-singing, ear-tests, solo and part singing); and Lectures on Theory (elements of music, harmony, counterpoint, and history of music). Attendance at certain of these Courses is expected of all students of music.

Gymnasium.

The Gymnasium is in the charge of Miss Holmstrôm, graduate of the Posse Gymnasium, Boston, and of the Harvard Summer School, who teaches on Swedish principles. Special attention is devoted to the application of exercise in cases of physical weakness, Miss Holmstrôm having had considerable experience in the medical branch of her work. All students undergo a physical examination on entering upon the gymnastic course, under the superintendence of Dr. R. Tait Mackenzie, B.A., M.D., Assistant Lecturer in Anatomy at the University. Teams of Basket-Ball are formed, and, when weather permits, this and other exercises are practised on the lawn, at the back of the College building. This ground is also provided with lawn-tennis courts.

The College Building.

The College is situated on Sherbrooke Street, at the head of Union Avenue, in close proximity to the University buildings and to the slopes of Mount Royal. The building is fireproof, and much thought and artistic care have been given to the furnishing and decoration.

On the ground floor are the offices of the Administration, including the rooms of the Warden and Secretary, the Professors' common room, lecture rooms (English, French, German, Mathematics) and a spacious dining hall. On the first floor are other lecture rooms (Latin, Greek, Logic, and Philosophy), the library, reading-room, Students' common room, and a handsome assembly hall. On the second and third floors are the rooms of the resident students. These are of varying size and plan. Each student has a separate bedroom, and, as a rule, one sitting-room is shared by the occupants of the two or three bedrooms immediately adjoining. The entire use of a sitting-room can be obtained, and there are some rooms which may be used as study-bedrooms. The rooms are completely furnished, and no article of furniture

need be brought by the students. No part need be taken by the students in the care of their rooms.

In addition to the lawn at the back of the College, the students are entitled to use, subject to regulations, the grounds of McGill University, with its tennis-courts, skating-rink, etc.

A nucleus of the College Library has been formed in a set of books, comprising the stated books and others referred to in connection with the University curricula, the modern language course being especially well represented. There are also works of general literature. The Library is a reading-room, and the books are not taken away; the students having access also to the University Lending Library.

Students of Music have the use of a large practising-room, and, at certain hours, of the piano in the common room, as also of the Gymnasium piano.

The Gymnasium, fully equipped in accordance with the requirements of the Swedish system, is in the basement. In connection with the Gymnasium there are bath-rooms and dressing-rooms.

The health of the students is under the charge of a competent physician practising in Montreal, who may be consulted free of charge.

Students of the Royal Victoria College, as students of McGill University, are entitled to the use of the University Library, containing about 88,000 volumes, and the Peter Redpath Museum containing large collections in Mineralogy, Palæontology, Zoology, Botany, Archæology, and Ethnology, and to work in the Physical, Chemical, Zoological, Botanical and other laboratories and the Botanic Gardens of the University. (For particulars of laboratories, etc., see University Calendar for 1902-1903, pp. 143 *et seqq.*

Board and Residence.

Residence in the College buildings is open to Undergraduates, Conditioned Students, or Partial Students, but the last are not received in residence unless they take courses of study



A Room in the Architectural Department.

approved by the Faculty of the College. The expense of board and residence ranges from $290 to $440 in addition to the sessional fees for tuition (see pp. 81-83), according to the room or rooms occupied by the students; for a majority of the rooms the expense of board and residence is $290. These charges cover the University Session, 10th September—30th April, and the summer classes, 30th April—28th June. A deduction of $50 is made in the case of Students who go out of residence at the end of the University Session.

Applications for admission or further particulars should be addressed to the Warden, Royal Victoria College, Montreal.

ROYAL VICTORIA COLLEGE.

FIRST YEAR.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Greek.	Physics.	Greek.	Greek.	Greek.	
10	English.	English.	French.	French.	Math.	
11	German.	Math.	Latin	English.	French.	
12	Latin.	Latin.	Math.	German.	Latin.	
2	Math.	French.	English.	Physics.	German.	
3			German.		English.	
4						
5						

SECOND YEAR.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Latin.	Greek.	French.	Math.	Greek	Chem. Lab.
10	German.	Math.	Math. Chem. Lab.	Latin.	German.	Chem. Lab.
11	Logic.	Chemistry.	Greek Chem. Lab.	English.	Latin.	Biol. Lab. (*b*) (Botany)
12	English.	Logic	Chemistry.	Logic.	Chemistry.	Biol. Lab. (*b*) (Botany)
2	French.	French.	Latin.	French.	English.	
3	Greek.	Biol. Lab. (Zoology) Chem. Lab.	Biology.	German.	Biol. Lab. (Zoology	
4	Biology.	Biol. Lab. (Zoology) Chem. Lab.	Biol. Lab. (*b*) (Botany)	Greek.	Biol. Lab. (Zoology)	
5		German.	Biol. Lab. (*b*) (Botany)		Chem. Lab.	

(*b*) During second term.

Faculty of Applied Science.

Opening of Session, 1902-3.

Field work in Surveying will begin on Monday, August 25th.

Lectures in all courses will begin on Tuesday, September 23rd.

Examinations.

For all students taking Surveying Field Work, supplemental examinations will be held in August, as per List "A."

For all other students, the supplemental examinations will be held in September, as per List "B."

Examinations for Exhibitions and Prizes will be held as follows:—

Mathematics, Saturday, Sept. 20th, a.m.
Theory of Structures, Monday, Sept. 22nd, a.m.
Descriptive Geometry, Monday, Sept. 22nd, a.m.
English, Monday, Sept. 22nd, p.m.

The examinations in Summer Reading will be held on Monday, September 22nd, p.m.

Regulations as to Supplemental Examinations.

Subjects of the First and Second Years.—Students who have failed in one or more subjects of examination will be allowed supplemental examinations in all such subjects. In case of failure in any subject in such supplemental examination, no further supplemental examination will be permitted during the session.

Subjects of the Third Year.—Students who have failed in one or more subjects of examination will be allowed supplemental examinations in all such subjects. In case of

failure in *one subject only*, a subsequent supplemental examination *may* be permitted by the Faculty; such permission will be granted only under special circumstances to be investigated in each case.

Conditioned Students.

Conditioned students are reminded that they cannot enter the Second Year of their course of study until their matriculation conditions have been removed. The examinations for this purpose must be taken at one or other of the regular Matriculation Examinations beginning on June 9th and on September 10th.

All candidates for such examinations must make application to the Registrar of the University not later than one month before the commencement of the examinations.

Fees.

Surveying Field Work.—The fee is $25.00, which must be paid to the Bursar of the University, on or before August 25th. (Cheques payable to the order of W. Vaughan). Each student will be required to show receipt for this fee to the Professor in charge of the Field Work. Credit for this amount will be given on payment of the usual annual fees.

Supplemental Examinations.—The fee is $2.00 for each examination period (morning or afternoon). It must be paid to the Bursar of the University not later than the day before the examinations, and receipt for the same shown to the Professor in charge before the examination papers are distributed.

Conditioned Students.—The fee for examination is $2.00.

SUPPLEMENTAL EXAMINATIONS, LIST A."

DATE.	FIRST YEAR SUBJECTS	SECOND YEAR SUBJECTS.	THIRD YEAR SUBJECTS.
AUGUST.			
Wednesday 20th, A.M.		Mechan. Drawing.	
P.M.		Chemistry.	
Thursday 21st.....A.M.	English.	Surveying.	Surveying.
P.M.	Exp. Physics.	Exp. Physics.	Thermodynamics.
Friday 22nd.....A.M.	Trigonometry. Dynamics.	Mechanics.	Theory Struc.
P.M.	Descr. Geometry.	Desc. Geometry.	Prac. Astron. Roads and Canals.
Saturday 23rd.....A.M.	Geometry. Algebra.	Anal. Geometry. Calculus.	Mathematics.

SUPPLEMENTAL EXAMINATIONS, LIST ".B."

DATE.	FIRST YEAR SUBJECTS.	SECOND YEAR SUBJECTS	THIRD YEAR SUBJECTS.
SEPTEMBER.			
Tuesday 16th.....P.M.		Kinematics.	Mach. Design.
Wednesday 17th..A.M.		Mechan. Drawing.	Mechan. Drawing. Elec. Meas. Ore Dressing. Adv. Mineral.
P.M.		Chemistry.	Geology. Anal. Chemistry.
Thursday 18th.....A.M.	English.	Surveying.	Surveying.
P.M.	Exp. Physics.	Exp. Physics.	Theory Struct.
Friday 19th.....A.M.	Trigonometry. Dynamics.	Mechanics.	Thermodynamics.
P.M.	Desc. Geometry.	Desc. Geometry.	Prac. Astronomy.
Saturday 20th.....A.M.	Geometry. Algebra.	Anal. Geometry. Calculus.	Mathematics.
Monday 22nd ....A.M.			Transportation.

Faculty of Applied Science.

§ I. General Statement.

The Instruction in this Faculty is designed to afford a complete preliminary training, of a practical as well as theoretical nature, in the following Departments:—

I.—Architecture.
II.—Civil Engineering and Surveying.
III.—Electrical Engineering.
IV.—Mechanical Engineering.
V.—Mining Engineering and Metallurgy.
VI.—Practical Chemistry.

The Degrees conferred by the University upon such undergraduates of the Faculty as fulfil the conditions and pass the Examinations hereinafter stated are, in the first instance, "Bachelor of Science" (B.Sc.), mention being made in the Diploma of the particular Department of study pursued, and, subsequently, the Degrees of "Master of Science" (M.Sc.), and "Doctor of Science" (D.Sc.).

§ II. Matriculation and Admission.

For subjects of matriculation, conditions and fees, see pp. 14-20.

§ III. Examinations and Degrees.

I. For the Degree of Bachelor of Science (B.Sc).

Sessional examinations in all the subjects are held at the end of each session (April). In addition, there are Christmas examinations in certain of the subjects, and class examinations are held from time to time.

II. Higher Degrees.

For regulations relating to the Degrees of "Master of Science" (M.Sc.), and "Doctor of Science" (D.Sc.), see pp. 26 and 27.

III. Special Provisions for Obtaining the two Degrees of "Bachelor of Arts" (B.A.), and Bachelor of Science (B.Sc.), in Six Years.

1. Undergraduates of the Faculty of Arts, who have taken all the Ordinary Mathematics of the first two years; and the Chemistry of the Second Year, and who wish to pursue their professional studies in the Faculty of Applied Science so as to obtain the degrees of B.A. and B.Sc. within the following four years, may be exempted by the Faculty of Applied Science from the Mathematics of the First Year in Applied Science and the Chemistry of the Second Year.

2. They are allowed to distribute the course of the Third and Fourth Years in Arts over three years.

3. They may complete the Arts curriculum by taking the following courses:

I. *In the Third Year:*
   (*a*) Physics of Third Year.
   (*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.
   (*c*) Either one or two hours weekly in English Composition.

II. *In the Fourth Year:*
   (*a*) The Mathematics of the Second Year Applied Science (6 hours weekly as $1\frac{1}{2}$ courses).
   (*b*) Physics of Fourth Year.
   (*c*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.
   (*d*) One hour weekly in English Composition if only one has been taken in the Third Year.

III. *In the Fifth Year:*

The Mathematics of the Third Year Applied Science (2 hours weekly as a half course), or another course under the heading "Science" in Arts curriculum.

The degree of B.A. may thus be obtained at the end of the Fifth Year from Matriculation.

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§ IV. Graduate Courses.

Students who take the Bachelor's degree in one of the courses provided by the Faculty of Applied Science may graduate in any of the remaining courses by attending one or more subsequent sessions.

Graduates may also take an advanced course in the branch in which they have received their degree. On passing an examination at the end of such advanced course, the Master's degree will be conferred without further examination, on presentation at the end of one additional year, of a satisfactory thesis on approved work.

Students are strongly recommended to take a Graduate Course, and special arrangements will be made for advanced and research work in the following :—

Architecture.—Advance study in design. Students may also take any of the options of the course (see page 182), and the course on Art History (see p. 118).

Chemistry and Mineralogy. (See § XI, 2, 9 and 14, and § XII, 4.)

The determination and comparison of the errors and the co-efficients of standards of length. (See § XI, 4, and § XII, 6.)

The determination of gravity. (See § XII, 6).

The elasticity and strength of materials. (See § XI, 3, and § XII, 13.)

Mining and Metallurgy—Advanced study in metallurgy and mining can be carried on with great advantage in the laboratories. (See § XI, 12, 15, and XII, 9 and 10.)

The efficiency of pumps and hydraulic motors. (See § XI, 3, and XII, 7.)

Ore Dressing, Coal Washing, and Gold and Silver Milling.—The laboratories of the Mining department have been equipped and arranged with especial reference to advanced and research work in the theory and practice of concentration. (See p. 227.)

The efficiency of power transmission by air, water, gas, and steam. (See § XI, 3, 5, 11.)

The efficiency of steam, gas and hot-air engines and of air compressors. (See § XI, 11 and 17.)

The efficiency of machines and machine tools, and the power absorbed by the several processes of mechanical work. (See § XI, 11.)

The efficiency of dynamometers, belting and shafting, including investigations into the relative merits of the several unguents. (See § XII, 8.)

The efficiency of the several types of boilers, including investigations on the heat producing power of fuels. (See § XI, 17.)

The flow of water through orifices and pipes, and over weirs. (See § XI, 3, and § XII, 7.)

Geodesy and practical astronomy. (See § XII, 6.)

Physics.—The Macdonald Physics Building has been equipped and arranged with special reference to Graduate Courses and original research work in various branches of pure Physics. Every facility will be afforded in the workshops for the construction of special apparatus required for such investigations. (See § XII, 12.)

Mathematics.—Students taking Graduate Courses will receive guidance in any advanced Mathematics required in connection with their work.

§ V. Attendance and Conduct.

See page 29.

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§ VI. Library.

Students in this Faculty are entitled to use the University Library under the regulations cited on p. 40. Students also have access to the various departmental libraries under the special regulations by which each is governed.

§ VII. Fees and Registration.

All fees and fines are payable to the Bursar.

The fees must be paid to the Bursar and the tickets of admission to classes shown to the Dean within a fortnight after the commencement of attendance in each session. In case of default, the student's name will be removed from the College books, and can be replaced thereon only by permission of the Faculty, and on payment of a fine of $2.

Annual fee for the undergraduate course	$156.00
The fees for Partial Students are :—$10.00 for Library, Athletics and Caution money ; and a fee at the rate of $5.00 for each hour of instruction per week, extending throughout the session.	
Deposit for caution money for undergraduates and conditioned students	5.00
Fee for ordinary supplemental examination	2.00
Fee for special supplemental examination	5.00
Fee for certificate of standing	2.00
Fee for Graduate Course	150.00

Graduates of this Faculty will be required to pay only one-half of this amount.

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§ VIII. Medals, Exhibitions, Prizes and Honours.

1. The British Association Medals and Exhibition, founded by the British Association for the Advancement of Science, in commemoration of the meeting held in Montreal in the year 1884.

ARCHITECTURAL DEPARTMENT.

Two Scholarships, of the value of $75.00, have been offered by Mr Andrew T. Taylor, F.R.I.B.A., for students entering the second year of the course; the first of these will be awarded in September, 1903; the second in September, 1904. The scholarships are restricted to students taking the full curriculum and proceeding to the degree of B.Sc. in Architecture. Candidates must have passed in all subjects of the first year (or have passed equivalent examinations, accepted by the Faculty, elsewhere).

For Session 1902–03, seven prizes, to cover the fee for the special course on Architectural Styles, have been offered to competition by a member of the Province of Quebec Association of Architects. Drawings in competition for these must be submitted to the Professor of Architecture not later than Thursday, September 18th, 1902. Full particulars can be obtained from the Professor of Architecture, or from the Dean of the Faculty of Applied Science.

A British Association Medal and Prize in Books are open for competition to students of the Graduating Class in each of the six Departments of the Faculty, and, if the examiners so recommend, will be awarded to the student taking the highest position in the final examinations.

2. The Governor General's Silver Medal (the gift of His Excellency The Right Honourable the Earl of Minto).

This medal will be awarded for graduate Research Work.

3. Summer Work. (See § IX, 1.) The following prizes are offered for the best summer Theses :—

To the students of the Civil Engineering Course, a prize of $25 presented by E. B. Greenshields, Esq., B.A.

To the students of the Electrical Engineering Course, a prize of $25 from the British Association fund.

To the students of the Mechanical Engineering Course, a prize of $25 presented by The Crosby Steam Gauge & Valve Co.

To the students of the Mining Engineering Course, a prize of $25 presented by Geo. E. Drummond, Esq.

Four prizes, each of the value of $25, are offered for competition to students of the Canadian Society of Civil Engineers, for the best papers on subjects in any department of engineering. The summer theses prepared by the students of this University are available for this competition.

A gold medal and two prizes of $35 and $15 offered by the Canadian Mining Institute, will be open for competition to students from McGill University, Toronto University and Queen's University, and will be awarded to the students presenting the best papers on some subject connected with mining, ore dressing, metallurgy, or economic geology. Preference will be given to those Theses which show decided originality.

The following Exhibitions and Prizes will be open for competition at the beginning of the Session. *Students are re-*

quired to notify the Dean of their intention to compete, at least one week before the commencement of the Examination.

4. A British Association Exhibition of $50.00 and prize of $25.00 to students entering the Fourth Year, the subjects of examination being the Mathematics and Theory of Structures of the Ordinary Course.

5. Three prizes of $25.00, $15.00 and $10.00, to students entering the Third Year, the subject of Examination being the Mathematics of the Second Year Course.

6. A Scott Exhibition of $50.00, founded by the Caledonian Society of Montreal, in commemoration of the Centenary of Sir Walter Scott, and two prizes of $25.00 and $15.00 to students entering the Second Year, the subjects of Examination being:—

(*a*) English Literature (Summer Vacation Work); (*b*) Mathematics of the First Year Course; (*c*) Descriptive Geometry of the First Year Course.

7. Two prizes, each of $10.00, presented by J. M. McCarthy, Esq., B.A.Sc., to students entering the Third Year, for proficiency in Levelling or Transit Work.

8. The sum of $150, presented by W. A. Carlyle, Esq., Ma.E., may be awarded in prizes to students of the Mining Course taking the highest positions in the degree examinations of 1903.

9. A prize of $50.00, presented by James Tighe, B.A.Sc., for research work in Hydraulics.

10. An exhibition offered to graduates by A. E. Childs, M.Sc., for a special research on "The flow of gas through pipes under pressure."

11. A scholarship of the value of $100, for proficiency in Practical Chemistry, on the endowment of the late Dr. T. Sterry Hunt, to students entering the Second Year of the Chemical Course. For further conditions apply to the Dean.

12. The Canadian General Electric Company, through Mr. F. Nicholls, of Toronto, has decided to present annually

to the Faculty four scholarships, each in the form of a three months' course at the Company's works at Peterboro or Montreal, with the addition of a sum of $100.00.

13. The Allis-Chalmers Company of Chicago has decided to present annually to the Faculty a scholarship in the form of a three or four months' course at the Company's works at Chicago, with the addition of a sum of $150.00.

14. Prizes or Certificates of Merit are given to such students as take the highest place in the Sessional and Degree Examinations.

15. Honours.—On graduation, Honours will be awarded for advanced work in Professional subjects.

16. Science Scholarships granted by The Royal Commission for the Exhibition of 1851.—The Scholarships of £150 sterling a year in value are tenable for two or, in rare instances, three years. They are limited, according to the Report of the Commission, "to those branches of Science such as Physics, Mechanics and Chemistry, the extension of which is specially important for our national industries." Their object is, not to facilitate ordinary collegiate studies, but "to enable students to continue the prosecution of Science with the view of aiding in its advance or in its application to the industries of the country."

A nomination to one of these scholarships for the year 1901 was placed by the Commission at the disposal of McGill University, and another may be granted in 1903.

This Exhibition has been awarded as follows:—

Evans, P. N., 1891; Macphail, J. A., 1893; King, R. O. 1895; Gill, J. L. W. 1897; McLean, W. B., 1899; McClung, R.K., 1901.

It is open to students of not less than three years' standing in the Faculties of Arts or Applied Science, and is tenable at any University or at any other Institution approved by the Commission.

17. Workshop Prizes.—A prize of $20.00, presented by C. J. Fleet, Esq., B.A., B.C.L., for bench and lathe work in the woodworking department, open to students of not more than two terms' standing in workshop practice.

§ IX. Special Provisions.

1. Summer Work.—During the summer vacation following the close of each year, all students entering the Third and Fourth Years are required to prepare a thesis on a subject specified by the Faculty. Any student may substitute for the specified subject a report on some practical work in course of construction. The marks given for these theses will be added to the results of the sessional examinations. The theses must be handed in to the Dean on or before October 1st.

2. All Students in the Civil, and Mining Engineering Courses, entering the Second and Third Years, Students in the Civil Engineering Course entering the Fourth Year, and Students in the Architectural Course entering the Third and Fourth Years, are required to be in attendance at the Surveying School on the 25th August, when the Field-book in Surveying and Geodesy will commence. (See§ XI, 14.)

3. All Students in the Mining Course are required to attend the Summer School in Mining, held between the Third and Fourth Years (four to six weeks of field-work). The school is held in May and June.

4. Partial Students may be admitted to the professional classes upon payment of special fees. (§ VII.)

5. Students in Applied Science may, by permission of the Faculty, take the Honour Classes in the Faculty of Arts.

6. Undergraduates in Arts of the Second and Third Years, or Graduates of any University, entering the Faculty of Applied Science, may, at the discretion of the Professors, be exempted from such lectures in that Faculty as they have previously attended as Students in Arts.

7. Students who have failed in a subject in the Christmas or Sessional Examinations may regain their standing by passing a supplemental examination at a time appointed by the Faculty. Unless such supplemental examination is passed, students will not be allowed to proceed to any subsequent examination in the subject. A second supplemental examina-

tion will not be granted unless under exceptional circumstances, to be investigated in each case by the Faculty.

8. Students may be required to answer satisfactorily a weekly paper on such subjects of the course as the Faculty may determine.

9. Credit will be given in the Sessional Standing for Class Examinations held during the session, and for the Christmas Examinations.

10. Students who fail to obtain their Session, and who in consequence repeat a Year, will not be exempted from examination in any of those subjects in which they may have previously passed, except by the express permission of the Faculty. Application for such exemption must be made at the commencement of the Session.

11. Partial Students are not eligible for prizes.

12. Certificates may be given to Students who have passed through any of the special courses attached to the curriculum.

13. The headquarters of the Canadian Society of Civil Engineers are located in Montreal. Students in all departments of engineering are strongly recommended to become student members of the Society, which they can do on payment of a fee of $2.00. They are then entitled to the two volumes of "Transactions," which are annually published, and to the use of the Society's rooms on Dorchester Street. They also have opportunities of meeting the prominent engineers of the country and of being present at the fortnightly sessions, at which papers are read by leading members of the Society on current engineering subjects and works of construction.

During the winter there will be a special series of students' meetings, at which papers, illustrated by lantern slides, will be delivered by well-known engineers. Students may also compete for the prizes which are offered by the Society, (see p. 167).

X. Departments.

I. Architecture.

The Architectural Course begins in the second year, for which the first year is preparatory, especially in the departments of Mathematics and Drawing (Freehand, Lettering, and Projections).

The work of the second year is of a general character, and is planned to combine to some extent the work of the Architectural and of the Civil Engineering students.

The third and fourth years are devoted to more specialized architectural study in various branches, and a fifth or graduate year has been organized for advanced study in design. For those students who desire to devote themselves more especially to the engineering side of architecture, the course is modified to include additional mathematics in the third year, and the advanced course of Theory of Structures in the fourth year. Such students devote proportionately less time to architectural drawing and designing.

In the second year the historical course embraces a survey of architectural history from ancient Egyptian to modern times. The great eras of European civilization are successively dealt with, and the evolution of styles is traced in their constructional and ornamental forms and methods.

In the third and fourth years the lectures are arranged in continuation and extension of this general course. Renaissance and Modern Architecture are studied in the third year; while a course, covering both third and fourth years, comprises more detailed study of ecclesiastical, domestic, and public architecture, and deals with the historic evolution of architectural styles and with the problems and requirements of modern work.

Instruction in drawing is given during all four years—freehand drawing (ornament and figure) from the cast, and architectural drawing occupying much of the students' time during three years of the course. Modelling in clay is included in the third and fourth years.

Problems in architectural design form the basis of work in the architectural drawing class from the earliest available period, being at first more especially combined with the study of the Classical Orders.

A course of lectures is included upon general art history, so as to place the architectural student in touch, not only with the decorative details of the different architectural styles, but also with contemporary forms in other branches of art, especially the decorative arts employed in building.

For the scientific side of professional study the courses in Mathematics are very fully developed in the first and second years, being continued in the third year also by those who elect to take the advanced course in Theory of Structures. Descriptive Geometry is studied, as well as elementary Shades and Shadows, and Perspective. A course in Surveying, both practical and theoretical, is also included ; four weeks before the beginning of the session are devoted to Field Work in each of the two last years. A short course in Geology is given in the fourth year.

Theory of Structures and Strength of Materials form one of the chief subjects of study in the third year, the course also comprising instruction in Graphic Statics, as well as supplementary work of a practical nature in the Testing Laboratories.

A full course on Building Construction and Architectural Engineering has been organized for the third and fourth years, common to both architectural and engineering students. It includes also Sanitation and Hygiene; Heating and Ventilation ; Specifications and Professional Practice.

A special course of lectures has been arranged to be available for those who are engaged in office work during the day ; it embraces the subject of Architectural Styles, their Features, Mouldings and Ornament. This course is planned with a view to preparation for the examinations for Associateship now held in colonial centres by the Royal Institute of British Architects ; it comprises a detailed

study of the three great divisions of historical architecture, Classical, Mediaeval and Renaissance, in accordance with the examination-programme of the Royal Institute.

The course will be repeated in session 1902-1903, if sufficient students come forward.

The subjects of instruction and the number of hours per week devoted to each subject are as follows :—

FIRST YEAR.

	Hrs.		Hrs.
Descriptive Geometry	(p. 192), 4	Mathematics	(p. 202), 10
English	(p. 196), 2	Physics	(p. 197), 2
Freehand Drawing	(p. 200), 3	Physical Laboratory	(p. 198), 4½
Lettering	(p. 200), 3	Shopwork	(p. 235), 7

SECOND YEAR.

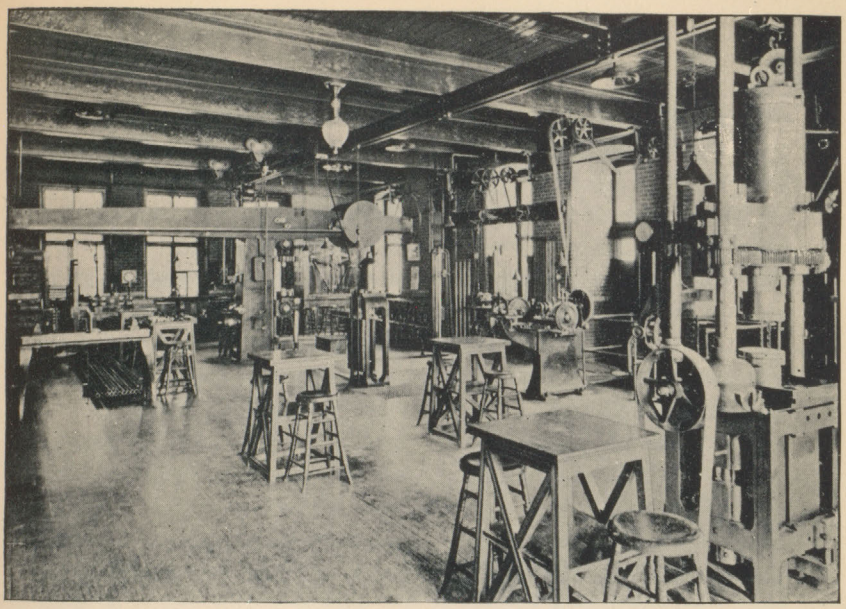
	Hrs.		Hrs.
Architecture (Elements of)	(p. 183), 1	Mathematics	(p. 202), 6
Architecture (History)	(p. 182), 2	Physics	(p. 197), 2
Chemistry	(p. 186), 3	Chemical Lab.	(p. 186), 3
Descriptive Geometry	(p. 192), 3	Physical Lab.	(p. 198), 3
Drawing and Design	(p. 184), 7	Shopwork	(p. 235), 3
Freehand Drawing	(p. 200), 4		

THIRD YEAR.

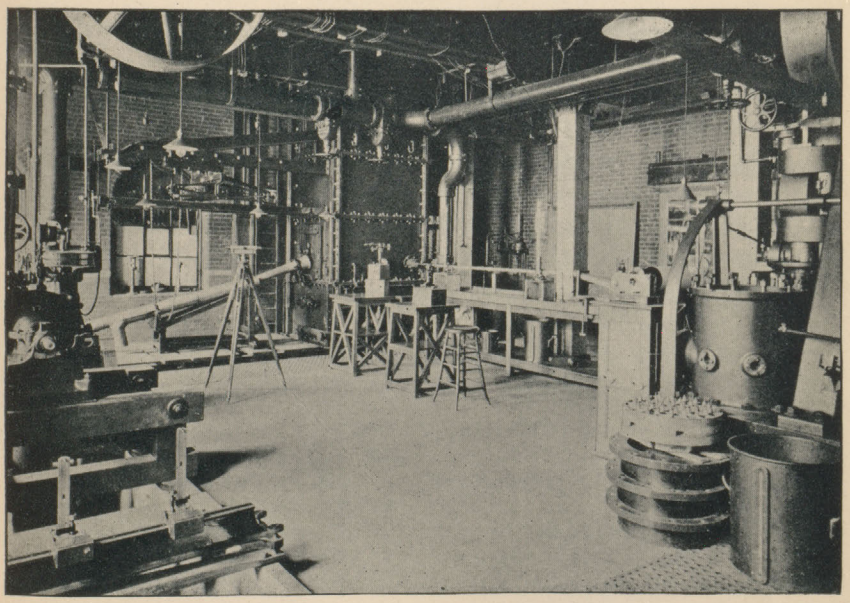
	Hrs.		Hrs.
Architecture	(p. 182), 1	Mathematics	(p. 202), 2 (opt.)
Architecture (History)	(p. 182), 2	Modelling	(p. 184), 3 (b)
Art History	(p. 183), 1	Municipal Engineering	(p. 191), 1 (opt.)
Descriptive Geometry	(p. 192), 3 (a)	Structural Engineering	(p. 184), 2
Designing or Drawing.	(p. 184), 10	Surveying	(p. 216), 3
Freehand Drawing	(p. 199), 5 (a), 7 (b)	Theory of Structures	(p. 189), 3
Graphical Statics	(p. 189), 2 (a)	Testing Laboratory	(p. 189), 3
Mapping	(p. 216), 3		

FOURTH YEAR.

	Hrs.		Hrs.
Architecture	(p. 182), 2	Municipal Engineering	(p. 191), 1 (opt.)
Art History	(p. 183), 1	Structural Engineering	(p. 184), 2
Designing	(p. 184), 20	Theory of Structures	(p. 188), 4 (opt.)
Freehand Drawing and Water Colouring	(p. 200) 6 (a), 9 (b)	Testing Laboratory	(p. 189), 4 (opt.)
Geology	(p. 200), 3 (a)		
Graphical Statics	(p. 189), 3 (opt.)		
Modelling	(p. 184), 3 (b)		



An Engineering Testing Laboratory.



Hydraulic Laboratory.

II. Civil Engineering.

The courses of study in this Department are designed to give to the student a sound theoretical and practical training in the sciences and principles which underlie the profession of a civil engineer. It is scarcely possible for any one person to become proficient in all branches of civil engineering, so wide is its scope and so inclusive is its purpose. As generally defined it is the "art of economically directing the great sources of power in nature to the use and convenience of man," by the construction of roads, railways, bridges, aqueducts, viaducts, canals, docks, harbours, breakwaters, light-houses, by the construction and adaptation of machinery, by the lighting and drainage of cities and towns, and by the exploitation of mines. All these works are more or less governed by the same principles, and in these principles the student is carefully instructed, and by means of numerous problems occurring in every day practice, he is taught to apply his knowledge to the actual conditions of life.

During the session arrangements are made for the delivery, by distinguished engineers, of special lectures or short courses of lectures on actual works of construction.

Provision is made, by means of advanced classes, for graduates and special students to continue their studies and to engage in researches with a view to the solving of some of the numberless problems which confront the engineer in every direction. Much valuable work of this character has been already accomplished, and especial reference may be made to the fact that for several years graduates of other Universities —some holding scholarships under the Royal Commissioners for the Exhibition of 1851—have carried out investigations in the several laboratories.

The subjects of instruction and the number of hours per week devoted to each subject are as follows:—

FIRST YEAR.

	Hrs.		Hrs.
Descriptive Geometry...(p. 192),	4	Mathematics.....(p. 202),	10
English .....(p. 195),	2	Physics.....(p. 197),	2
Freehand Drawing.....(p. 200),	3	Physical Laboratory....(p. 198),	4½
Lettering .....(p. 200),	3	Shopwork .....(p. 235),	7

SECOND YEAR.

	Hrs.		Hrs
Building Construction	(p.184), 1	Physics	(p. 19)7, 2
Chemistry	(p. 186), 3	Surveying	(p. 215), 3
Descriptive Geometry	(p. 192), 3	Chemical Laboratory	(p. 186), 3
Mapping	(p. 216), 6	Physical Laboratory	(p. 198), 3
Mathematics	(p. 202), 6	Shopwork	(p. 235), 4

THIRD YEAR.

	Hrs.		Hrs.
Descriptive Geometry	(p. 192), 4	Railway Structures	(p. 218), 3 (b)
Geology	(p. 200), 3	Roads and Canals	(p. 218), 2
Graphical Statics.	(p. 189), 2 (a), 3 (b)	Structural Engineering	(p. 184), 2
Mapping	(p. 216), 6	Surveying	(p. 216), 2
Mathematics	(p. 202), 2	Theory of Structures	(p. 188), 3
Mechanical Drawing.	(p. 206), 3 (opt.)	Thermodynamics	(p. 219), 1
Municipal Engineering	(p. 191), 1	Testing Laboratory	(p. 189), 3
Museum Work in Geology	(p. 201), 1 (b)	Thermodynamic Lab.	(p. 231), 2 (b)

FOURTH YEAR.

	Hrs.		Hrs.
Designing	(p. 184), 6	Railway Engineering	(p. 218), 2
Geodesy	(p. 216), 2	Structural Engineering	(p. 184), 2
Graphical Statics	(p. 189), 3	Theory of Structures	(p. 188), 4
Hydraulics	(p. 190), 2	Geodetic Laboratory	(p. 217), 4
Mechanical Engineering	(p. 206), 2 (a)	Hydraulic Laboratory	(p. 191), 3 (a)
Municipal Engineering	(p. 191), 1	Testing Laboratory	(p. 189), 6

III. Electrical Engineering.

The first and second years of the undergraduate course of instruction in Electrical Engineering, are devoted, mainly, to a preparation in mathematics, physics, chemistry, mechanics, drawing, shop work and work in the physical and chemical laboratories.

The electrical studies of the third year embrace a consideration of continuous current flow, in circuits of different kinds, the principles of electro-magnetism, electrical measurements and the design and action of commutating machinery.

The fourth year is devoted principally to electrical work, and includes lectures and recitations on variable and alter-

nating curent phenomena, the principles of action and the design of alternating current machinery, electric lighting and systems of power distribution, central station design and operations, urban and inter-urban railways and long distance power transmission.

In the second term of the fourth year a choice may be made between electro-chemistry and hydraulics. Each fourth year student is required to present a thesis giving the results of a suitable experimental investigation.

The subjects of instruction and the number of hours per week devoted to each subject are as follows:—

FIRST YEAR.

	Hrs.		Hrs.
Descriptive Geometry	(p. 192), 4	Mathematics	(p. 202), 10
English	(p. 196), 2	Physics	(p. 197), 2
Freehand Drawing, Machine Sketching and Lettering	(p. 200), 6	Physical Laboratory	(p. 198), 4½
		Shopwork	(p. 235), 7

SECOND YEAR.

	Hrs.		Hrs.
Chemistry	(p. 186), 3	Physics	(p. 197), 3
Kinematics of Machines	(p. 204), 3	Chemical Laboratory	(p. 186), 6
Mathematics	(p. 202), 6	Physical Laboratory	(p. 198), 6
Mechanical Drawing	(p. 205), 3	Shopwork	(p. 235), 6

THIRD YEAR.

	Hrs.		Hrs.
Chemistry	(p. 187), 1	Physics	(p. 198), 2
Continous Currents and Commutating Machinery	(p. 193), 2	Theory of Structures	(p. 188), 3
Machine Design	(p. 205), 1	Chemical Laboratory	(p. 222), 3
Mathematics	(p. 202), 2	Elect. Eng. Laboratory	(p. 194), 6
Mechanical Drawing	(p. 205), 3	Physical Laboratory	(p. 198), 6
		Civ. Eng. Laboratory	(p. 191), 3 (b)

FOURTH YEAR.

	Hrs.		Hrs.
Alternating currents and Alternating current machinery	(p. 193), 3	Machine Design	(p. 205), 1 (a)
Electro-Chemistry	(p. 187), 1 (b)	Mechanical Engineering	(p. 206), 2 (a)
Electrical Designing	(p. 194), 4	Thermodynamics	(p. 219), 2
Electric Lighting and Power Distribution	(p. 193), 3 (a)	Civ. Eng. Laboratory	(p. 191), 3 (a)
Electric Traction	(p. 194), 3 (b)	Electro-Chemical Lab.	(p. 188), 3 (b)
Hydraulics	(p. 190), 2	Electrical Engineering Lab	(p. 194), 9
		Mech. Eng. Laboratory	(p. 226), 3

IV Mechanical Engineering.

The complete Undergraduate course in Mechanical Engineering extends over four years, and provision is made for a fifth year or Graduate course in advanced experimental and other work.

The first two years of the Undergraduate course of instruction are largely devoted to preparation in mathematics, physics, chemistry, mechanics, drawing, and shopwork. During the second year one lecture and one exercise class per week are devoted to the Kinematics of Machines.

While motion without regard to force is treated in the Kinematic course, the action of external forces in producing or changing motion in the links of mechanisms is considered in the third and fourth years, under the head of Dynamics of Machines. Two lectures per week are given in this subject in each year, and exercise classes are held for the purpose of working the problems necessary for illustration.

The work in Machine Design is carried on during the third and fourth years in conjunction with the practical instruction in mechanical drawing and designing in the Drawing Rooms.

A course of two lectures per week is given, during the fourth year, on Mechanical Engineering as applied to questions connected with Power Installations and Prime Movers. A large portion of the work of this course is supplementary to, and follows, the instruction given in Thermodynamics and Machine Design, which extends over the Third and Fourth Years. (See page 219.)

Instruction in Workshop Practice (see page 233) is given in each of the four years. It is of a systematic nature, and is intended to prepare for, but by no means to replace, that practical experience of workshop operations on a commercial basis which every mechanical engineer must obtain for himself.

The work of the Lecture Rooms is illustrated throughout the course by experimental work carried out by the student, and by demonstrations in the laboratories of the department.

Arrangements are made for occasional visits to power-plants and manufactories of importance.

The subjects of instruction and the number of hours per week devoted to each subject are as follows :—

First Year.

	Hrs.		Hrs.
Descriptive Geometry..(p. 192),	4	Mathematics.....(p. 202),	10
English .....(p. 196),	2	Physics .....(p. 197),	2
Freehand Drawing.....(p. 200),	3	Physical Laboratory..(p. 198),	$4\frac{1}{2}$
Lettering .....(p. 200),	3	Shopwork .... (p. 235),	7

Second Year.

	Hrs.		Hrs.
Chemistry.....(p. 186),	3	Physics.....(p. 197),	2
Descriptive Geometry....(p. 192),	3	Chemical Laboratory.....(p. 222),	2
Kinematics of Machines.(p. 204),	3	Physical Laboratory..... (p. 198),	3
Mathematics .....(p 202),	6	Shopwork .....(p. 235),	7
Mechanical Drawing. ...(p. 205),	6		

Third Year.

	Hrs.		Hrs.
Dynamics of Machines.(p. 205),	2	Theory of Structures..(p. 188),	3
Continuous Currents and Commuting Machinery .....(p. 194),	2	Thermodynamics .....(p. 219),	2
Graphical Statics.....(p. 189),	2 (a)	Elect. Eng. Laboratory(p. 194),	3
Machine Design.....(p. 205),	2	Testing Laboratory...(p. 189),	3
Mathematics.....(p. 202),	2	Mech. Eng. Laboratory(p. 226),	3
Mechanical Drawing..(p. 205),	6	Shopwork.....(p. 235),	6
		Physical Laboratory..(p. 198),	3

Fourth Year.

	Hrs.		Hrs.
Designing .....(p. 184),	6	Mechanical Engineering.....(p. 204),	2
Dynamics of Machines...(p. 205),	4	Thermodynamics .....(p. 219),	4
Hydraulics and Hydraulic Machinery ....(p. 190),	2	Hydraulic Laboratory.(p. 191),	3 (b)
Machine Design.....(p. 205),	2	Mech. Eng. Lab ..... (p. 226),	12
		Shopwork ..... (p. 235),	4

V. Mining and Metallurgy.

I. The first two years of the undergraduate course in Mining and Metallurgical Engineering are mainly devoted to Mathematics, Mechanics, Physics, Elementary Chemistry, etc., as it is deemed necessary that the students should master the general principles underlying all scientific work before they attack the somewhat complex and specialized subjects of the professional course.

In the third year the department gives elementary courses in both Mining and Metallurgy, and a thorough course in Fire Assaying, but again the chief work of the year is in Applied Mechanics, Elementary Mechanical Engineering, Geology, Mineralogy and Chemistry.

The fourth year, on the other hand, is very largely given up to special work in Mining and Metallurgy, and, in addition to the lectures and demonstrations, nearly two days per week are spent in the department laboratories and drawing room.

The subjects of instruction and the number of hours per week devoted to each subject are as follows :—

First Year.

	Hrs.		Hrs.
Descriptive Geometry..(p. 192),	4	Mathematics.....(p. 202),	10
English.....(p. 196),	2	Physics.....(p. 197),	2
Freehand Drawing.....(p. 200),	3	Physical Laboratory..(p. 198),	4½
Lettering.....(p. 200),	3	Shopwork.....(p. 235),	7

Second Year.

	Hrs.		Hrs.
Chemistry.....(p. 186),	3	Surveying.....(p. 215),	3
Descriptive Geometry....(p. 192),	3	Chemical Laboratory.....(p. 222),	6
Mapping.....(p. 216),	3	Physical Laboratory.....(p. 198),	3
Mathematics.....(p. 202),	6	Shopwork.....(p. 235),	4
Physics.....(p. 197),	2		

THIRD YEAR.

	Hrs.		Hrs.
Chemistry	(p. 186), 1 (b)	Mining	(p. 211), 1
Geological Excursions.	(p. 201), 3 (c)	Ore-Dressing	(p. 211), 2 (b)
Geological Museum Work	(p. 232), 1 (a) 2 (b)	Surveying	(p. 215), 2
Geology	(p. 200), 3	Theory of Structures.	(p. 188), 3
Graphical Statics	(p. 189), 2 (a)	Transportation	(p. 218), 1
Machine Design	(p. 205), 2	Chemical Laboratory	(p. 222), 3
Mapping	(p. 216), 6 (a)	Determinative Mineralogy Laboratory	(p. 210), 3
Mathematics	(p. 202), 2	Fire Assaying Laboratory	(p. 207), 4 (b)
Mechanical Drawing	(p. 205), 3	Ore-Dressing Lab	(p. 227), 2 (b)
Metallurgy	(p. 207), 2 (a)	Testing Lab	(p. 189), 3 (d) (b)
Mineralogy	(p. 210), 2		

FOURTH YEAR.

	Hrs.		Hrs.
Chemistry	(p. 186), 2 (b) opt.	Mining Problems.	(p. 212), 1 (b) opt.
Designing	(p. 184), 3 (b)	Mining Machinery:	(p. 211), 2 (b)
Geology and Ore Deposits,	(p. 201), 3 (b)	Mining Colloquium	(p. 212), 1
Geological Colloquium.	(p. 202), 1 (b)	Ore-Dressing & Milling.	(p. 212), 2 (a)
Hydraulics	(p. 190), 1 (a), 1 (b) opt.	Physiography	(p. 202), 1 opt.
Hydraulic Machinery	(p. 191), 1	Petrography	(p. 201), 1 (a)
Metallurgy	(p. 207), 2	Mechanical Engineering,	(p. 204), 2 (a)
" Iron and steel.	(p. 208), 1 (a)	Chemical Lab	(p. 222), 9 (a), 6 (b)
" Alloys	(p. 208), 1 (b) opt.	Hydraulic Laboratory.	(p. 191), 3 (a)
" Advanced	(p. 208), 1 opt.	Metallurgical Lab	(p. 208), 5 (a) 11 (b)
" Electro	(p. 208), 1 (b) opt.	Ore-Dressing Lab.	(p. 212), 5 (a)
Mineralogy	(p. 210), 2 (a)	Petrographical Lab	(p. 201), 3 (b)
Mining	(p. 211), 3		

VI. Practical Chemistry.

The course in Practical Chemistry is arranged to give the student in the first two years a thorough knowledge of the fundamental principles of Chemistry and Physics, with sufficient Mathematics to enable him to understand the theoretical parts of these subjects.

In the two subsequent years Chemistry, analytical, organic, and physical, is taught both in its purely scientific aspects and in its relation to all kinds of commercial work. Special facilities are afforded for the prosecution of post-graduate research work in all the branches of Chemistry.

The subjects of instruction and the number of hours per week devoted to each subject are as follows :—

FIRST YEAR.

	Hrs.		Hrs.
Descriptive Geometry..(p. 192),	4	Mathematics.....(p. 202),	10
English.....(p. 196),	2	Physics.....(p. 197),	2
Freehand Drawing.....(p. 200),	3	Physical Laboratory..(p. 198),	4½
Lettering.....(p. 200),	3	Shopwork.....(p. 235),	7

SECOND YEAR.

	Hrs.		Hrs.
Chemistry.....(p. 186),	3	Chemical Laboratory...(p. 222),	17
Mathematics.....(p. 202),	6	Physical Laboratory.....(p. 198),	3
Physics.....(p. 197),	2		

THIRD YEAR.

	Hrs.		Hrs.
Chemistry.....(p. 186),	3	Mineralogy.....(p. 210),	2
Determinative Mineralogy(p. 210),	3	Ore-Dressing.....(p. 211),	1
Geology.....(p. 200),	3	Chemical Laboratory...(p. 222),	18
Metallurgy.....(p. 207),	1		

FOURTH YEAR.

	Hrs.		Hrs.
Chemistry.....(p. 187),	4	Chemical Laboratory....(p. 222),	29
Mineralogy.....(p. 210),	2 (a)		

§ XI. COURSES OF LECTURES.

N.B.—The following courses are subject to such modifications during the year as the Faculty may deem advisable.

I. Architecture.

PROFESSOR:—S. H. CAPPER.
LECTURER:—H. F. ARMSTRONG.

The courses of study are as follows :—

1. General Architectural History. Second Year. (First Term), Ancient Egypt; Greece; Rome, Byzantine and Early Christian Architecture. (Second Term), Romanesque; the Monastic Orders; Gothic; Renaissance. Tues., 12; Thurs., 11. Mr. Capper.

Text Books:—Smith & Slater: "Architecture, Classic & Early Christian;" Smith & Poynter: "Architecture, Gothic & Renaissance" (S. Low, Marston, & Co.); *or* Hamlin: "History of Architecture" (Longmans, Green, & Co.).

Reference Books:—Fergusson: "History of Architecture" (Murray); R. Sturgis: "European Architecture" (Macmillan).

2. Renaissance and Modern Architecture. Third Year. (First Term), Italy; Spain. (Second Term), France; England; Colonial; Modern. Mon., 12; Thurs., 9. Mr. Capper.

Text Books:—Anderson: "Renaissance Architecture in Italy" (Batsford); Blomfield: "Short History of Renaissance Architecture in England" (Bell).

Reference Books:—Fergusson: "History of Modern Architecture" (Murray); Gotch: "Early Renaissance Architecture in England" (Batsford); Blomfield: "Renaissance Architecture in England" (Bell).

3. Domestic, Public, and Ecclesiastical Architecture. Third and Fourth Years together. Historical Survey; modern conditions and requirements. Mon., 9. Mr. Capper.

Reference Books:—Statham: "Modern Architecture" (Chapman & Hall); Stevenson: "House Architecture" (Macmillan).

4. Elements of Architecture. Second Year. The classical Orders; arcading, mouldings, etc., classical and gothic; composition; elements of architectural effect; style. Wed., 11. Mr. Capper.

Reference Books:—Baldwin Brown: "The Fine Arts" (Murray, Scribner); Statham: "Architecture for General Readers" (Chapman & Hall).

5. Art History. Third and Fourth Years together. Sculpture; painting; the industrial arts. Tues., 9. Mr. Capper.

Reference Books:—Baldwin Brown: "The Fine Arts" (Murray, Scribner); Upcott: "Introduction to Greek Sculpture" (Clarendon Press); Gardner: "Handbook of Greek Sculpture" (Macmillan); Woltmann & Woermann: "History of Painting" (Kegan, Paul, & Co.); Labarte: "Histoire des Arts Industriels" (Morel).

6. Drawing and Modelling.
   (*a*) Freehand Drawing from the cast (ornament and figure). Second Year, 4 hrs.; Third and Fourth Years, 6 hrs.; extra time for Water Colour work. Mr. Armstrong.
   (*b*) Architectural Drawing and Design.—Mr. Capper. Second Year, 7 hrs. Studies of the orders; rendering with pen and brush; elementary problems in design.
   Third Year, 10 hrs. Problems in Design.
   Fourth Year, 20 hrs. Problems in Design.
   Advanced (Graduate) Course. Problems in Design.
   (*c*) Modelling. Third and Fourth Years, 3 hrs. (second term). Architectural ornament modelled in clay from the cast. Mr. Armstrong.

Structural Engineering.

Messrs. E. E. S. Mattice, B.A.Sc. (McGill), and M. C. J. Beullac, B.Sc. (Univ. of France), of the Dominion Bridge Works, give special courses of lectures on Mondays and Fridays, at 2 p.m., in the following :—

1. Building materials; the history, properties, tests and uses of all materials of construction.
2. Specifications and professional practice; the different methods of preparing specifications for estimates, instructions to bidders, and rules to be observed in writing specifications, general clauses, law of contracts.
3. Building Construction :
   (*a*) Carpentry; frames, joints, framing of floors and roofs, partitions, bridging, furring, etc.



In the Drawing Rooms.



Carpenter Shop.

(*b*) Slow burning construction.
(*c*) Masonry.

4. Hygiene :
   (*a*) Plumbing.
   (*b*) Disposal of household refuse.
   (*c*) Heating.
   (*d*) Ventilation.
5. Steel frame buildings; design, mill-work, steel and cast iron columns and connections, beams and girders, framing and wind bracing.

Special designs will be prepared in the drawing-room illustrating the several subjects of the lectures.

R. I. B. A. Examinations.

The Royal Institute of British Architects having decided to hold in the Colonies qualifying examinations for Associateship, and Montreal having been selected as the examination-centre for the Dominion, a special course of lectures in preparation for these examinations will be given during the winter, provided a sufficient number come forward to attend it. The course will embrace the subject of Architectural Styles, their Features, Mouldings, and Ornament, comprising a study in detail of the three great divisions of historical architecture, Classic, Mediæval and Renaissance, in accordance with the programme of the Royal Institute. The lectures will be given on Monday, Tuesday, and Thursday, from 5.30 to 6.30 p.m., unless other times prove more convenient to the majority of those attending. The Architectural Library will be available for reading and reference to those taking this course; it is open in the evening from 7.30 to 10.30, as well as during the day. The fee for the course is fifteen dollars ($15.00).

Architectural Equipment.

The architectural equipment consists of a representative collection of casts, comprising architectural detail and ornament, as well as figure sculpture; of photographs and illus-

trations; an arc-light electric lantern; a large collection of slides, diagrams, and models; and a library for architectural study. (See § XIII.)

Women Students.

The classes in freehand drawing, and modelling, and in architectural design, as well as the architectural lectures, are open to women students. Information as to admission may be obtained on application to the Dean of the Faculty or to the Professor of Architecture.

2. Chemistry and Assaying.

PROFESSORS:—B. J. HARRINGTON.
J. WALLACE WALKER.
ASSISTANT PROFESSOR:—N. NORTON EVANS.
DEMONSTRATORS:—J. HENDERSON.
D. MACINTOSH.
F. SODDY.
L. O. HOWARD.
CHARLES S. PATERSON.
E. H. ARCHIBALD.
LECTURE ASSISTANT:—L. C. GRATON.

Students in all the departments of Applied Science are expected to take up the study of Chemistry in the Second Year, having previously acquired a knowledge of some branches of Physics in the First Year of their course. They attend a course of lectures, supplemented by tutorial classes, on the laws of Chemical Combination, Chemical Formulæ and Equations, the preparation and properties of the more important Elements and their Compounds, etc. They must also devote at least one morning or afternoon a week throughout the session to practical work in the laboratory, where they learn the construction and use of ordinary apparatus, and perform a series of experiments designed to cultivate the powers of observation and deduction. Many of the experiments involve accurate weighing, and for this purpose the elementary laboratory is well supplied with balances. During the second term considerable attention is also devoted to the subject of Qualitative Analysis.

The lectures in the Third Year comprise :—

(*a*) A course dealing mainly with the methods and reactions employed in chemical analysis, being explanatory of the work done in the laboratory ; one lecture a week during the session. (*b*) A course on Industrial Chemistry ; two lectures a week during the first term. (*c*) An elementary course on Organic Chemistry ; two lectures a week during the second term. (*d*) A course on the composition and analysis of Iron and Steel ; one lecture a week during the second term.

The laboratory work of the Third Year comprises :—

(*a*) An extensive course of Analytical Chemistry, including gravimetric, volumetric and electrolytic methods. (*b*) An elementary course on the preparation of Organic Compounds. (*c*) Water Analysis and Analysis of Iron and Steel, both in the second term. *Students in the Mining Course are exempt from Organic Chemistry.*

Lectures in the Fourth Year comprise :—

(*a*) A systematic course on Organic Chemistry, two lectures a week. (*b*) A course on Physical Chemistry, two lectures a week. (*c*) A course on Mineral Analysis. (*d*) A short course on Gas Analysis. In the lectures on Organic Chemistry special attention is paid to the commoner substances which find applications in the Arts. The lectures on Physical Chemistry are divided into two parts. In the first term they include a study of such physical properties of gases, liquids, and solids as are known to depend upon their chemical constitution ; also Thermo-Chemistry and the law of Mass Action. The second term is devoted to Electro-Chemistry, theoretical and applied. The lectures will be based upon the application of the gaseous laws to solutions. This will be followed by descriptions of the most recent applications of Electricity to the production of Metals and Chemicals.

Laboratory work in the Fourth Year will be arranged to suit the requirements of students. Those intending to prosecute organic work will take up a complete course of Organic

Preparations and Analysis, but they must also spend some time on the essential Physico-Chemical methods; while students of Physical Chemistry must spend enough time in the Organic Laboratory to become familiar with the chief methods of organic work. Those intending to devote themselves to Mineral Chemistry will omit the Organic Chemistry, but must study the more important Physico-Chemical methods, and devote a large amount of time to advanced Mineral Analysis. All students in the Chemistry Course must take up Gas Analysis.

Laboratory courses will also be provided for students who wish to make a speciality of any particular branch of Industrial Chemistry, such as the Chemistry of Oils, Iron and Steel Analysis, Bleaching, Papermaking, and manufacture of Chemicals, etc.

Of the above Fourth Year subjects students in the Mining Course take only the lectures and practical work in Mineral Analysis.

3. Civil Engineering and Applied Mechanics.

PROFESSOR:—HENRY T. BOVEY.
ASSISTANT PROFESSORS:—R. S. LEA.
E. G. COKER.
DEMONSTRATOR:—K. M. CAMERON.

1. *Theory of Structures.*—The lectures on this subject embrace :—

(*a*) The analytical and graphical determination of the stresses in the several members of framed-structures, both simple and complex, as, *e.g.*, cranes, roof and bridge trusses, piers, etc.

(*b*) The methods of ascertaining and representing the shearing forces and bending moments to which the members of a structure are subjected.

(*c*) A study of the strength, stiffness, and resistance of materials, including a statement of the principles relating to work, inertia, energy, together with a discussion of the nature

and effect of the different kinds of stress, and the resistance offered by a material to deformation and to blows.

(*d*) The design and proper proportioning of beams, pillars, shafts, roofs, bridge piers and trusses, arches, arched ribs, masonry dams, foundations, earth works, and retaining walls.

Graphics.—A complete course of instruction is given in the graphical analysis of arches and of bridge, roof, and other trusses, and in the graphical solution of mechanical problems. It is therefore possible for the student to apply both the analytical and graphical methods of treatment, and thus to verify the accuracy of his calculations. Dr. Bovey and Dr. Coker.

Text Book:—Bovey's Theory of Structures and Strength of Materials.

The Laboratory Work (see § XII.) is as follows :—

Fourth Year.—During the Fourth Year students are expected to engage in a research upon the physical properties of a material of construction, with special reference to the form and position of such material in the structure ; or research work may be taken up on the flow of water, through orifices and pipes, over weirs, and on the efficiency of vanes, pumps and hydraulic motors.

Third Year.—During the Third Year a systematised course of Laboratory Instruction is given in which students carry out for themselves a series of Tests upon Engineering Materials. The course comprises :

I. Linear measurements by Whitworth Measuring Machine, Dividing Engine, and Micrometer Gauges.
II. Calibration of extensometers, gauges, and the like.
III. Tension tests of long wires above and below the elastic limit.
IV. Tensile and compressive tests of cast iron, wrought iron, steel, brass, copper, timber, stone, bricks, and cements.
V. Transverse tests of beams under different conditions of loading and fixing.

VI. Shearing tests of iron, steel, timber, stone, and the like.

VII. Torsional tests of metals.

VIII. Tests of materials under compound stress.

IX. Tests of chains, wire cables, spikes, screws and the like.

X. Pillar tests under various conditions of loading and fixing.

XI. Determination of the various moduli of materials by static and dynamic methods.

XII. Determination of centres of gravity, moments of inertia, and moments of resistance.

XIII. The testing of concrete and cement in accordance with standard specifications.

2. *Bridge Construction.*—A course of lectures is given on practical bridge construction, including :

(*a*) The reasons governing the selection of a particular type of bridge ;

(*b*) A discussion of the loads to which the bridge will be subjected ;

(*c*) The calculations of the stresses in the several members of the bridge ;

(*d*) The determination of the sectional areas and forms of the members ;

(*e*) The design of the connections ;

(*f*) The preparation of complete engineering drawings.

Dr. Bovey and Dr. Coker.

3. *Hydraulics.*—The student is instructed in the fundamental laws governing the equilibrium of fluids, and in the laws of flow through orifices, mouthpieces, submerged (partially or wholly) openings, over weirs, through pipes, and in open channels and rivers. The impulsive action of a free jet of water upon vanes, both straight and curved, is carefully discussed, and is followed by an investigation of the power and efficiency of the several hydraulic motors, as, *e.g.,* Reaction Wheels, Pressure Engines, Vertical Water Wheels, Turbines, Pumps, etc. Dr. Bovey, Dr. Coker.

Text Book :—Bovey's Hydraulics.

The laboratory work (see also § XII) will include the following :—

(*a*) *Flow through orifices.*—The determination of the co-efficients of discharge, velocity, etc.

(*b*) *Flow over weirs.*—The determination of the co-efficient of discharge with and without side contraction. Also the measurement of the section of the stream.

(*c*) *Flow through pipes.*—The determination of critical velocities and of the effect upon the flow, of angles, bends, and sudden changes in section.

(*d*) *Impact.*—The determination of the co-efficient of impact.

(*e*) *Motors, etc.*—The determination of the efficiency of Pelton and other wheels, of vortex and other turbines, of centrifugal and other pumps, etc.

4. *Hydraulic Machinery.*—The lectures in this Course apply the principles of hydraulics to explain the construction and action of Hydraulic Presses, Accumulators, Lifts, Rams, Riveting machinery, Pumps, Multi-cylinder Engines, Workshop Tools, Turbines, Centrifugal Pumps, and the like. The design of one or two types is considered in detail.

The hydraulic transmission of power and the design and construction of central stations is also included.

As far as possible working drawings are used to illustrate the lectures. Dr. Coker.

5. *Municipal Engineering.*—The lectures on this subject will embrace :—

(*a*) *Water Supply.*—The quantity and quality of water; systems and sources of supply ; rainfall and evaporation ; storage as related to the supplying capacity of water-sheds; natural and artificial purification; distribution, including the location of mains, hydrants, stop-valves, etc.; combined or separate fire and domestic systems; details of construction, including dams, reservoirs, pumps, etc.; preliminary surveys, estimates of cost, statistics, etc.

(*b*) *Sewerage of Cities and Towns.*—The various systems for the removal of sewage; special methods in use for its treatment and ultimate disposal; the proportioning and construction of main, branch, and intercepting sewers ; manholes, flush-tanks, catch-basins, etc.; materials used in construction; estimates of cost. Mr. Lea.

6. *Structural Engineering.*—A special course of lectures on this subject is given by Messrs. E. S. S. Mattice, B.A.Sc., and M. C. J. Beullac, B.Sc., of the Dominion Bridge Company. For details of this course see § XI, 1, p. 184

4. Descriptive Geometry.

LECTURERS:—C. H. McLEOD.
H. F. ARMSTRONG.

This course deals with the methods of representing objects on one plane so that their true dimensions may be accurately scaled. It discusses the methods employed in the graphical solution of the various problems arising in engineering design, and deals generally with the principles underlying all constructive drawing. The methods taught are illustrated by applications to practical problems. It is the aim of the work to develop the imagination in respect to the power of mentally picturing unseen objects, and, incidentally, precision in the use of the drawing instruments is attained.

First Year.—Geometrical drawing, orthographic projections, including penetrations, developments, sections, etc. Isometric projection. Mr. Armstrong.

Second Year.—Problems on straight line and plane. Projections of plane and solid figures. Curved surfaces and tangent planes. Intersections of curved surfaces. Axometric projections. Shades and shadows. Professor McLeod.

Third Year.—Mathematical perspective and perspective of shadows, etc. Spherical projection, and the construction of maps. (This course is given under Surveying and Geodesy, see XI, 16, p. 215).

5. Electrical Engineering.

PROFESSOR:—R. B. OWENS.
ALSISTANT PROFESSOR :—L. A. HERDT.
DEMONSTRATORS :—H. A. BURSON.
E. L. FRANKLIN.

Undergraduate Courses.

1. *Continuous Currents and Commutating Machinery.*—The theoretical consideration of continuous current flow in circuits of different kinds. The laws of electro-magnetism and of the magnetic circuit. The action and principles of design of commutating and rectifying machinery; required of students in Electrical and Mechanical Engineering.

T. and Th., 9-10—Mr. Herdt. First and Second terms.

Text-books :—Elements of Electricity and Magnetism, J. J. Thomson; Magnetic Induction in Iron and other Metals, J. A. Ewing ; Continuous Current Dynamos, J. Fisher-Hinnen.

2. *Alternating Current and Alternating Current Machinery.*—The theoretical consideration of variable current flow in circuits containing resistance, inductance and capacity under different conditions. The action and principles of design of synchronous and induction machinery; required of students in Electrical Engineering. Must be preceded by Course 1.

W., Th. and F., 11-12—Professor Owens. First and Second terms.

Text-books :—Theoretical Elements of Electrical Engineering, C. P. Steinmetz; Alternating Currents and Alternating Current Machinery, D. C. Jackson.

3. *Electric Lighting and Power Distribution.*—The design and operation of central and isolated lighting and power plants. The design and construction of distributing lines. Arc and incandescent lighting. The applications of stationary motors to general power purposes; required of students in Electrical Engineering. Must be preceded by Course 1.

T., W. and F., 10-11—Mr. Herdt. First term.

Text-books :—Electric Lighting, F. B. Crocker; Electric Power Transmission, Louis Bell.

4. *Electric Traction.*—Determination of power required to accelerate and draw, at different speeds, loads under varying track and other conditions. Car equipment as affected by nature of service. Track construction. Systems of distribution for urban and for heavy through traffic conditions; required of students in Electrical Engineering. Must be preceded by Course 1.

T., W. and F., at 10-11—Mr. Herdt. Second term.

Text-books :—The Electric Railway, Louis Bell. Students are furnished with supplementary notes.

5. *Electrical Designing.*—(*a*) Detailed electric and magnetic calculations and complete drawings for a commutating machine, a synchronous machine and a transformer or an induction motor; required of students in Electrical Engineering. Must be preceded by Course 1 and taken in conjunction with Course 2.

Saturday, 9-1—Professor Owens. First and Second terms.

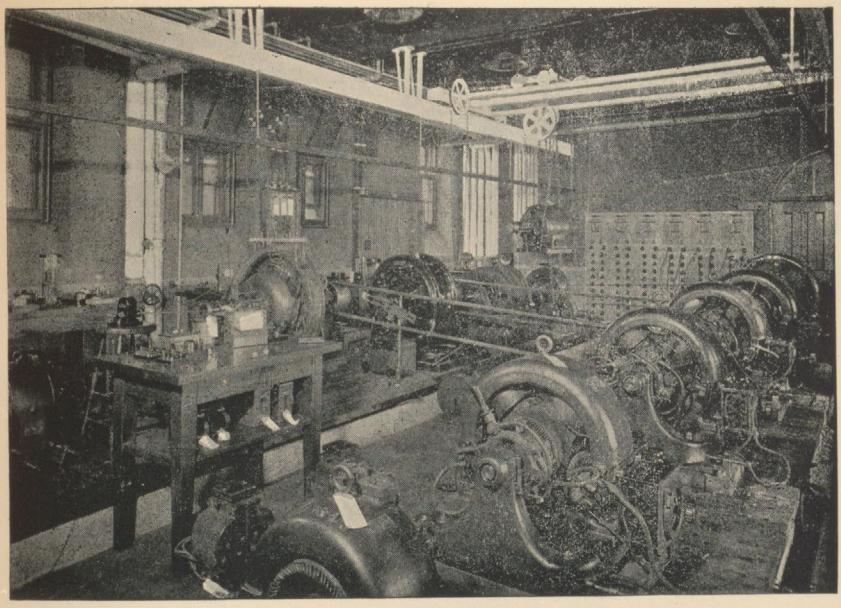
Text-books :—Continuous Current Dynamos, J. Fisher-Hinnen ; The Induction Motor, B. A. Behrend. Supplemented by MS. notes and data.

(*b*) Complete plans and estimates for an isolated or central lighting or power plant, including distributing system; required of students in Electrical Engineering. Must be preceded by Course 1 and taken in conjunction with courses 3 and 4.

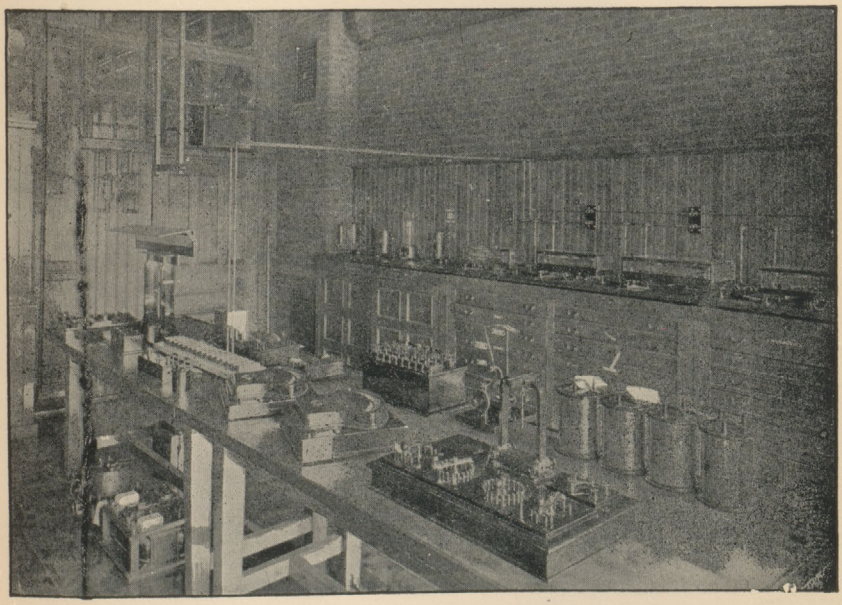
Mr. Herdt. First and Second terms.

Text-books:—No text-books. Notes and data are furnished.

6. *Electrical Engineering Laboratory.*—(*a*) Includes such tests of direct current metering and controlling devices, dynamos, motors, boosters, motor-generators, dynamotors, converters, open and closed coil, constant current machines and arc and incandescent lamps as illustrate the principles of their action and the limits of their proper use; also complete test of direct current isolated or central lighting or



Alternating Current Dynamo Laboratory.



Electrical Standardizing Room.

power plant; required of students in Electrical Engineering. Must be taken in conjunction with or be preceded by Course 1.

T., Th., 2-5—Professor Owens, Mr. Herdt, Mr. Burson. First and Second terms.

Text-books :—Handbook for the Electrical Laboratory and Testing Room, J. A. Fleming. In addition, students are furnished with special laboratory notes and forms.

(*b*) Includes experiments on variable current flow in circuits of different kinds; tests of alternators, synchronous motors and converters, compensators, induction motors, transformers, frequency and phase-changing apparatus, potential regulators, reaction coils, etc., and complete test of alternating lighting or power plant; required of students in Electrical Engineering. Must be preceded by Course 1 and taken in conjunction with Course 2.

M., W. and F., 2-5—Professor Owens, Mr. Herdt, Mr. Burson. First and Second terms.

Text-books:—No text-books. Students are furnished with special Laboratory notes and forms.

7. *Telegraphy and Telephony.*—Single duplex, quadruplex and multiplex telegraph systems, telephone systems, current generation for telegraph and telephone work, central telegraph and telephone stations. Line construction and testing. Special systems of signalling; optional. One lecture per week, at time to be arranged—Profssor Owens. First term.

Text-books :—Telegraphy, Preece and Sievewright ; A manual on Telephony, Preece and Stubbs.

Graduate Courses.

8. *Special problems in the theory and practice of alternating current working.*—Two lectures per week at time to be arranged—Professor Owens. First and Second terms.

9. *Special problems in Electric Traction.*—One lecture per week at time to be arranged—Mr. Herdt. First and Second terms.

10. *Advanced Laboratory Investigations.*—Special research work by students having necessary previous training —Professor Owens, Mr. Herdt.

11. *Electrical Engineering Seminar.*—Weekly meetings are held, at which students present carefully prepared papers upon current engineering literature and special topics in connection with their studies or their Laboratory work—Professor Owens, Mr. Herdt.

6. English Language and Literature.

PROFESSOR:—C. E. MOYSE.
LECTURER:—J. W. CUNLIFFE.

In view of the importance of accuracy of expression to those engaged in scientific or professional work, a course in English Composition is prescribed for all undergraduates of the First Year, and no student will be allowed to enter the Second Year until he has given satisfactory proof that he is able to write intelligently, clearly, and correctly. In order to make the instruction as practical as possible, short essays on current events and simple literary and historical subjects are required weekly, and will be commented upon in class in illustration of the points advanced in the lectures, which will aim at explaining the elementary principles of composition. (Two hours a week.) The hand-book used is Carpenter's Elements of Rhetoric, First High School Course (Macmillan Co.), and every member of the class is required to provide himself with a copy. Students who prove themselves competent may be excused further work in composition, and additional exercises will be required from those who are backward. Satisfactory results must be obtained in the regular essay work, as well as in the examinations, in order to pass in the subject. A short course of lectures will be given introductory to the course of Summer Reading.

Summer Reading.—During the vacation, students entering the Second Year are expected to read certain standard works in literature and fiction, on which an examination will

be held in the beginning of October. The marks obtained in this examination will be reckoned in determining the relative standing at the sessional examinations at the end of the Second Year.

The works selected for the vacation of 1902 are :—

Shakspere's Henry V., ed. Deighton (Macmillan);

Goldsmith's Vicar of Wakefield ;

Scott's Waverley ;

Stevenson's Kidnapped.

French Students may substitute for the above the following :

Corneille—Le Cid, Horace.

V. Hugo—Hernani, Ruy Blas.

Balzac—Eugenie Grandet.

Students will also be required to possess some knowledge of the lives of the above French authors.

Students who have already taken equivalent courses in this, or in any other University, may be exempted from a part or from the whole of the above work, on written application to the Dean.

7. Experimental Physics.

PROFESSORS:—JOHN COX.
E. RUTHERFORD.
ASSISTANT PROFESSOR:—H. T. BARNES.
DEMONSTRATORS:—A. G. GRIER.
H. L. COOKE.
S. J. ALLEN.

The instruction includes a fully illustrated course of Experimental Lectures on the general Principles of Physics (embracing, in the First Year—*The Laws of Energy—Heat, Light, and Sound*; in the Second Year—*Electricity and Magnetism*), accompanied by courses of practical work in the Laboratory, in which the students will perform for themselves experiments, chiefly quantitative, illustrating the subjects treated in the lectures. Opportunity will be given to acquire experience with all the principal instruments used in exact physical and practical measurements.

LABORATORY COURSE.

Three hours per week spent in practical measurements in the Macdonald Physical Laboratory in conjunction with the lecture courses.

Sound.—Velocity of Sound ; determination of rates of vibration of tuning forks; Resonance; laws of vibration of strings.

Light.—Photometry; Laws of Reflection and Refraction; focal lengths and magnifying powers of mirrors, lenses, telescopes and miscroscopes; the sextant; spectroscope, spectrometer, diffraction grating, optical bench, polariscopes.

Heat.—Construction and calibration of thermometers ; melting and boiling points; air thermometer; expansion of solids, liquids and gases; calorimetry; pyrometry.

Text Books:—Deschanel, Part IV.; or Ganot; Jones, Sound, Light and Heat; Wright, Heat; Tory and Pitcher, Laboratory Manual; Chandler, Laboratory Manual.

Magnetism and Electricity. — Measurements of pole strength and moment of a magnet; the magnetic field; methods of deflection, and oscillation; comparison of moments and determination of the elements of the earth's magnetism; frictional electricity.

Current Electricity.—A complete course of measurements of current strength, resistance, and electromotive force; calibration of galvanometers; the electrometer; comparison of condensers; electromagnetic induction.

Text Books:—S. P. Thompson, Electricity and Magnetism; Tory and Pitcher, Laboratory Manual.

Second Year.—Electrical Engineering Students are given an extra laboratory period of 3 hours per week, which allows of a more extended and complete course of experimental work.

Third Year.—Students of Electrical Engineering will continue their work in the Physical Laboratory in the Third Year. The following is a brief outline of the course :—

Magnetic elements and measurements. Use of Variometers. Testing magnetic qualities of iron.

Theory and practice of absolute electrical measurements.

Comparison and use of electrical standards of resistance, E.M.F., self-induction, and capacity.

Principles of construction of electrical instruments.

Testing and calibration of ammeters, voltmeters and watt-meters.

Insulation and capacity tests. Electrometers and Ballistic methods.

Construction and treatment of storage cells. Testing for capacity and rate of discharge.

Electric light photometry.

The following are some of the sections in which special provision has been made for advanced physical work :—

Heat.—Thermometry. Comparison and verification of delicate thermometers. Air thermometry. Measurement of high temperatures. Electrical resistance thermometers and pyrometers. Thermo-electric pyrometers.

Calorimetry. Mechanical Equivalent of Heat. Variation of specific heat with temperature. Latent heat of fusion and vaporisation. Heat of solution and combustion. Electrical methods.

Radiation and conduction of heat with special methods and apparatus. Dynamical theory of gases.

Viscosity, Surface Tension. Variation of properties with temperature.

Light.—Photometric standards. Spectro-photometry. Theory of colour vision. Spectroscopy and spectrum photography. Compound prism spectrometers. Six inch and 2½ inch Rowland Gratings. Study of spectra of gases. Fluoressence and anomalous dispersion. Polarimetry. Landolt and other polarimeters. Form of wave surface.

Sound.—Velocity in gases and various media. Absolute determinations of period. Harmonic analysis of sounds. Effects of resonance and interference.

Electricity and Magnetism.—Magnetic properties. Influence of stress and torsion. Influence of temperature. Effects of hysteresis. Magneto-optics. Other effects of Magnetisa-

tion. Diamagnetism. Electrical standards and absolute measurements. Calibration of electrical instruments. Insulation and capacity testing. Electrometer and Ballistic methods. Temperature, variation of resistance, and E.M.F. Thermo-electric effects. Electrolysis. Chemistry of primary and secondary batteries. Resistance of Electrolytes. Polarisation. Electric discharge in gases and high vacua. Dielectric strength. Behaviour of insulators under electric stress. Specific inductive capacity. Electro-magnetic optics. Alternating currents of high frequency and voltage. Electrical waves and oscillations. Discharge of electrification by Röntgen rays, ultra violet, uranium and thorium radiations.

Professor Cox will give a special course of lectures to advanced and graduate students, on " the relations between optics, electricity and magnetism," and Prof. Rutherford will gave a course on " Radio-Activity in electric oscillations."

N.B.—Students taking a Graduate Course will receive guidance in any advanced Mathematics required in connection with their work.

8. Freehand Drawing, Lettering, Etc.

ASSISTANT PROFESSOR:— H. F. ARMSTRONG.

In the *Freehand Course,* the object is to train the hand and eye so that students may readily make sketches from parts of machinery, etc., either as perspective drawings in light and shade, or as preparatory dimensioned sketches from which to make scale drawings.

In the *Lettering Course,* plain block alphabets, round writing, and titles, will be chiefly dealt with. In this course, also, tinting, tracing, blue printing and simple map drawing, will be included.

9. Geology.

PROFESSOR:—F. D. ADAMS.
DEMONSTRATOR:—_____

The courses are arranged as follows :—

Third Year.—

General Geology.—The lectures will embrace a general survey of the whole field of Geology, and will be introduced by a short course on Mineralogy. Especial atten-

tion will be devoted to Dynamical Geology and to Historical Geology, including a description of the fauna and flora of the earth during the successive periods of its past history, as well as to the economic aspects of the subject.

The lectures will be illustrated by the extensive collections in the Peter Redpath Museum, as well as by models, maps, sections, and lantern slides. There will be an excursion every Saturday until the snow falls, after which the excursion will be replaced by a demonstration in the Museum.

Books of Reference:—Scott, An Introduction to Geology; Dana, Manual of Geology.

Petrography.—The modern methods of study employed in Petrography are first described, and the classification and description of rocks is then taken up.

In addition to the lectures, one afternoon a week during the second term will be devoted to special microscopical work in the Petrographical Laboratory.

Text Book:—Harker, Petrology for Students.

Ore Deposits and Practical Geology.—The nature, mode of occurrence and classification of Ore Deposits are first discussed and a series of typical occurrences are described. The methods employed in carrying out geological surveys and in preparing geological sections are then taken up, with special studies in folding, faulting, etc. The course will be illustrated by maps, models, specimens, and lantern slides.

Text Books :—Geikie, Outlines of Field Geology ; Kemp, Ore Deposits of the United States; Phillips and Louis, A Treatise on Ore Deposits.

Books of reference:—The Monographs of the U.S. Survey.

Canadian Geology.—A general description of the Geology and Mineral Resources of the Dominion.

Petrographical Laboratory.—See § XII, 11. This laboratory is open to Fourth Year mining students during the second term.

Geological Colloquium.—A discussion each week during second term of some geological topic, references to the literature of which have been given by the Professor in the week preceding. The course is intended to give students some acquaintance with geological literature, as well as a wider knowledge of the great principles which underlie the science.

Physiography.—(Alternative with course on advanced metallurgy.)—The first part of the course will consist of a description of Land Forms, and their influence upon human development; while the latter part will be devoted to a study of the physical features of Canada. The course will be illustrated by maps, models, and lantern slides.

Field Work.—The students in mining will receive a course of instruction in geological mapping and field work—extending over one week—in connection with the summer school of mining.

NOTE.—Students of the Mining and Chemistry courses take all the Mineralogy of the Third Year. Mining Students take all courses of the Fourth Year. Chemistry Students take, in addition to the Geology of the Third Year, the Mineralogy of the Fourth Year.

The Petrographical Laboratory is open to Fourth Year Mining Students during the second term.

10. Mathematics and Mathematical Physics.

PROFESSOR:—G. H. CHANDLER.
LECTURER:—R. S. LEA.

The work in this department is conducted from the outset with special reference to the needs of Students of Applied Science. Much time is given to practice in the use of mathematical tables, particular attention being paid to the solution of triangles, the tracing of curves, graphical representation of

functions, reduction of observations, etc. Areas, volumes, masses, centres of gravity, moments of inertia, etc., are determined both by calculation and by observation or experiment, and each method is made to supplement or illustrate the other. In this connection, use will be made, in actual laboratory practice, of a large amount of apparatus, such as balances, Atwood's machines, inclined planes, chronographs, rotation apparatus of various kinds, etc. The different methods of approximation and the reduction of results of experiments and observations will also receive due attention.

The courses of study are as follows :—

First Year.

Geometry.—Exercises on Euclid, including Loci, Transversals, etc. Elements of Solid Geometry and of Geometrical Conic Sections.

Algebra.—Miscellaneous theorems and exercises. Complex Numbers. Elementary Determinants.

Trigonometry.—Plane and Spherical.

Mechanics.—An elementary course in Kinematics, Kinetics, Statics, and Hydrostatics.

Second Year.

Analytic Geometry.—The Point, Straight Line, Circle, Parabola, Ellipse, and Hyperbola.

Differential and Integral Calculus.— Differentiation of functions of one or more variables. Successive differentiation. Tangents, etc. Multiple Points. Asymptotes. Curvature. Maxima and Minima. Integration, with applications to Areas, Volumes, Moments of Inertia, etc.

Mechanics.—Kinematics. Kinetics of a Particle. Statics.

Third Year.

Analytic Geometry.—Conjugate diameters. General Equation of the second degree. Elements of Geometry of three Dimensions.

Calculus.—Various applications.

Mechanics.—Friction. Work and Energy. Dynamics of Rotation. Impact. Centres of Pressure, etc.

Classes may also be held for advanced (optional) work in the above or other subjects. Students taking Graduate Courses will receive guidance in any advanced Mathematics required in connection with their work.

Text Books. First Year:—Wilson's Solid Geometry and Conic Sections (Macmillan). Hall & Knight's Elementary Algebra (Macmillan). Murray's Plane and Spherical Trigonometry (Longmans). Blaikie's Dynamics (J. Thin, Edinburgh. Bottomley's Mathematical Tables (Macmillan), Chambers's Mathematical Tables.

Text Books. Second and Third Years :—Wentworth's Analytic Geometry (Ginn & Co.). Chandler's Calculus (E. M. Renouf, Montreal). Wright's Mechanics (Van Nostrand).

II. Mechanical Engineering.

PROFESSOR:—R. J. DURLEY.
ASSISTANT PROFESSOR:—H. M. JAQUAYS.
DEMONSTRATOR:— _____

1. *Kinematics of Machines.* (Wednesday, 11; Thursday, 10).

Definitions. Mechanisms and machines. Kinematic pairing. Velocity and acceleration in mechanisms. Centrodes. Restraint in mechanisms. Analysis of the quadric crank chain, the slider-crank chain, and the double-slider crank chain. Higher Pairing in mechanisms. Cams. Ratchet and click trains. Chamber-crank and chamber-wheel trains. Mechanisms involving non-rigid links. Screw motion and spheric motion in mechanisms.

BOOK OF REFERENCE:—

Kennedy's Mechanics of Machinery, (Macmillan).



In the Drawing Rooms.



Carpenter Shop.

2. *Dynamics of Machines.*—Third Year.—(Monday, 10; Wednesday, 9). Elementary dynamics of the steam engine. Diagrams of crank effort. Fluctuation of energy and speed. Flywheels. Friction of journals and pivots. Graphic treatment of friction in mechanisms. Brakes. Dynamics of belt and rope driving. Transmission and absorption dynamometers.

Fourth Year.—(Tuesday, 9, Wednesday, 9, Thursday, 12.) Balancing of double and single acting engines. Dynamics of the connecting rod. Gyrostatic action in machines. Theory of governors. Graphic methods in dynamics. Vibration in machines. Knocking of steam engines.

3. *Machine Design.*—Third Year.—Thursday, 10. Principles of the Strength of Materials as applied to the design of the parts of machines. Fastenings used in machine construction, bolts, screws, keys, cotters, rivets and rivetted joints. Journals and bearings. Shafts and couplings.

Fourth Year.—(Monday, 9, Wednesday, 12).—Design of wheel gearing. Belts, ropes, and pulleys. Pipes and pipe joints. Cylinders. Eccentrics, pistons and piston rods, connecting rods cross-heads and other engine details. Flywheels. Design of valves and valve gears.

Text-book:—Unwin's Machine Design (Longmans, 2 Vols.).

Book of Reference :—Low and Bevis' Machine Drawing and Design. (Longmans).

4. *Mechanical Drawing and Designing.*—Second Year.—(Monday and Thursday, 2). Elementary principles of mechanical drawing and draftsmanship. Preparation of working drawings of simple machine details. Making dimensioned sketches of machines and their parts. Dimensioning and conventional colouring of drawings. Preparation of tracings.

Third Year (Monday and Thursday, 2).—Designing of simple machine parts. More difficult exercises in mechanical drawing. Engine designing.

Fourth Year (Monday and Thursday, 2).—The complete design of a machine, such as a steam engine, a pump, or a machine tool, is worked out, and the requisite working drawings and tracings are prepared.

5. *Mechanical Engineering.*—(Thursday, 10; Friday, 9).

Steam boilers and steam production. Fuel and Combustion. Corrosion and defects of boilers. Boiler Installations. The Steam Engine; estimation of power developed under various conditions. The indicator and its diagrams. Steam distribution, and performance of pumping and air-compressing machinery, as shown by the indicator. Economy of steam machinery. Gas and oil engines. Gas producers. Mechanical distribution of power, and losses of power, in power installations and workshops. Air compressors. Fans. Pumping Machinery. Steam engine valves and valve gears. Valve diagrams. Speed regulation in steam engines. Lubrication in steam engines. Steam turbines and engines for special services. Relation between weight and power in steam machinery. Marine engines and ship propulsion. Elements of locomotive engineering. Tractive force in locomotives. Train resistance. Brakes. Refrigerating machinery.

Books of Reference:—Ewing's The Steam Engine (Camb. Univ. Press); Lineham's Mechanical Engineering (Chapman & Hall); Hutton's Mechanical Engineering of Power Plants (Wiley).

6. *Thermodynamics.* See page 219.
7. *Laboratory Instruction.* See page 226.
8. *Workshop Practice.* See pages 233-236.

Graduate Courses.

The Graduate Courses in Mechanical Engineering comprise experimental research work of the following kinds :—

Tests of the economy and performance of steam engines and boilers, air and gas engines, and air compressors. Experiments on the behaviour of superheated steam, on cylinder condensation, on feed heating, and on the value of fuels.

Experiments on the properties and relative values of lubricants, on transmission and absorption dynamometers, on the efficiency of transmission machinery and of machine tools. Tests of fans and blowers. Experiments on the flow of air and of steam. Researches on the tempering and welding of various materials, on the properties of alloys and on the action of cutting tools.

12. Metallurgy.

PROFESSOR:—ALFRED STANSFIELD.
DEMONSTRATOR:—HOWELLS FRÉCHETTE.

I. The Undergraduate Courses are as follows :—

Third Year.—(1) General Elementary Metallurgy, including introduction, fuels, furnaces and refractory materials, typical metallurgical operations and reactions, and the metallurgy of iron and steel. One lecture a week—Dr. Stansfield.

Text Book :—Huntingdon and Macmillan, "Metals, their Properties and Treatment."

(2) Fire Assaying, including introductory, furnaces and appliances, balances and wet assay apparatus, sampling and preparation of ores for assay, fluxes and reagents, assays of gold, silver, and lead ores, assays of bullion and base bullion.

Lectures, demonstrations, and laboratory work, 50 hours, during Second term—Dr. Stansfield.

Text Book :—Furman, "Manual of Practical Assaying."

Fourth Year:—(3) The Metallurgy of Copper, Lead, Gold and Silver. The lectures cover the more important dry and wet methods of extracting these metals from their ores, and of refining them, with the exception of the electrolytic methods (see (7)), and of the milling or amalgamation of gold and silver ores (see Mining (6)). Two lectures a week—Dr. Stansfield. Laboratory, see (9).

Books of Reference :—E. D. Peters, "Modern Copper Smelting"; H. O. Hoffman, "Metallurgy of Lead"; H. F.

Collins, "Metallurgy of Silver and Lead"; T. K. Rose, "Metallurgy of Gold"; M. Eissler, "Metallurgy of Gold"; C. Schnabel, "Handbook of Metallurgy," Vol. I.; F. L. Bosqui, "Notes on the Cyanide Process."

(4) The Metallurgy of Iron and Steel. One lecture a week during First term—Dr. Stansfield.

Books of Reference :—T. Turner, "Metallurgy of Iron"; H. M. Howe, "Metallurgy of Steel"; F. W. Harbord, Metallurgy of Steel"; H. H. Campbell, "Manufacture and Properties of Structural Steel."

(5) Alloys: Their constitution, manufacture and properties. Fuels and refractory materials: their examination and use, including calorimetry, pyrometry, and furnace efficiencies. One lecture a week during Second term—Dr. Stansfield.

Books of Reference :—W. C. Roberts-Austen, "Introduction to the Study of Metallurgy"; R. H. Thurston, "Materials of Engineering."

(6) Advanced Metallurgy, comprising Metallurgical Colloquia, and lectures on the Metallurgy of zinc, nickel cobalt, antimony, arsenic, bismuth, mercury, and tin. One hour a week—Dr. Stansfield.

Book of Reference, for the lectures:—C. Schnabel, "Handbook of Metallurgy," Vol. II. (This course is alternative with Physiography, see page 202.)

(7) The Electro-Metallurgy of copper, gold, silver, aluminum, nickel, iron, etc. One lecture a week during Second term—Dr. Stansfield.

Book of Reference:—W. Borchers, "Electric Smelting and Refining." (This course is alternative with Hydraulics.)

(8) Metallurgical Machinery (see page 211.)

(9) Laboratory:—One whole day and one-half day per week are given to work in the Ore Dressing and Metallurgical Laboratories. In the first term this time is evenly divided between Ore Dressing and Metallurgy, and certain typical

operations in each are carried out either as demonstrations, or by groups or individual students.

The whole time in the laboratory in the second term is given to thesis work, and in this individual work each man is permitted to elect between mining, ore dressing, and metallurgy, and, when practicable, to select his own special subject.

The following metallurgical exercises will be carried out, as far as time will permit, during the First term, either as demonstrations, individual work, or work in groups. During the Second term, any of these or some similar exercises may be selected by the students as their thesis work :—

Roasting a sulphide or arsenical ore on a small scale and also in the large roasting furnaces.

Formation and properties of copper or lead mattes and slags.

Smelting a copper or lead ore in the water jacketed blast furnace.

Melting and casting certain metals and alloys.

The use of the electric furnace.

Cyaniding or chlorination of a gold ore.

Leaching a copper or silver ore.

Elementary exercises in some of the following :—

Pyrometry, Calorimetry, Flue Gas Analysis, Tests of Refractory Materials, Microscopic Examination of Metals, Heat Treatment of Iron or Steel—Dr. Stansfield.

The details of the ore dressing work are given in Mining (8).

II. *Graduate Courses.*—Special advanced courses of laboratory work are offered in Metallurgy and Assaying.

III. *Metallurgical and Assaying Laboratories.*—For description see page 226.

IV. *Metallurgical Excursions and Summer School.*—Students attending the courses in Mining and Metallurgy are required to attend the Summer School in Mining (see Mining VI.) at the end of their Third Year.

At this school, when practicable, a portion of the time is devoted to a thorough examination of some metallurgical establishments.

In addition to this, excursions may be made by the class from time to time to such metallurgical works as are within reach.

13. Meteorology.

Instruction in Meteorological Observations will be given in the Observatory at hours to suit the convenience of the Senior Students.

Certificates will be granted to those Students who pass a satisfactory examination on the construction and use of Meteorological Instruments, and on the general facts of Meteorology.

14. Mineralogy

PROFESSOR:—B. J. HARRINGTON.

The courses are arranged as follows :—

Third Year :—

Mineralogy.—Lectures and demonstrations illustrated by models and specimens in the Peter Redpath Museum. Among the subjects discussed are : Crystallography ; physical properties of minerals dependent upon light, electricity, state of aggregation, etc. ; chemical composition, calculation of mineral formulæ, quantivalent ratios, etc. ; principles of classification, description of species.

Determinative Mineralogy.—Laboratory practice in blowpipe analysis and its application to the determination of mineral species.

Fourth Year :—

Mineralogy (In continuation of the course in Third Year) —Description of species, particular attention being paid to those which are important as rock constituents and to the economic minerals of Canada.

15. Mining Engineering.

PROFESSOR:—JOHN BONSALL PORTER.
FELLOW IN MINING:—C. V. CORLESS.

I. The Undergraduate Courses in detail are as follows:—

Third Year.—(1) Mining. An elementary course on methods of mining, shaft sinking, drifting, mining, hauling and hoisting. This course is arranged with a view to preparing the men for the summer school in mining and for the advanced work of the Fourth Year. (One hour per week in first term.)

(2). Ore-Dressing. The theory and practice of ore dressing and coal washing. The forms in which ores occur and the effect of mixture, impurity, etc. The theoretical considerations affecting mineral separations. The general mechanical operations involved. Dressing Machinery: breakers, rolls, screens, jigs, vanners, tables, washers, buddles, magnetic separators, etc. (Two hours per week in the second term. This course is continued in the Fourth Year. See Mining 6.)

(3). Laboratory. Simple examinations and tests of ores, sands, and gravels, by means of pan, vanning shovel, hand jig, magnet, classifier, etc. (Eight afternoons in the second term.) Further laboratory in Fourth Year, see Mining 8.)

Fourth Year.—(4). Mining Engineering. The Principles and Practice of Mining. Prospecting, sinking, drifting, developing, methods of mining, timbering, hauling, hoisting, drainage, lighting, ventilating, etc. Mine accidents and their prevention; general arrangement of plant, administration, stores and dwellings. Examination and valuation of mines and mineral properties and mine reports. (Three lectures a week.)

(5). Mining and Metallurgical Machinery. The generation, transmission and utilization of power in Mining, Ore Dressing and Metallurgy; steam, hydraulic and electric power plants, air compressors, blowing engines, dynamos,

transmission lines, motors, conveyors, cranes, hoists, pumps, ventilating machinery, etc. (Supplementing Mech. Engineering of first term.) Two lectures a week in the second term and twelve afternoons in the designing room and laboratory.

(6). Ore Dressing and Milling. Continuation of the ore dressing course of the Third Year. Concentration plants, coal breakers and washers, dry concentration, gold washing, dredging and hydraulicing, amalgamation, gold and silver milling. (Two lectures a week in the first term.)

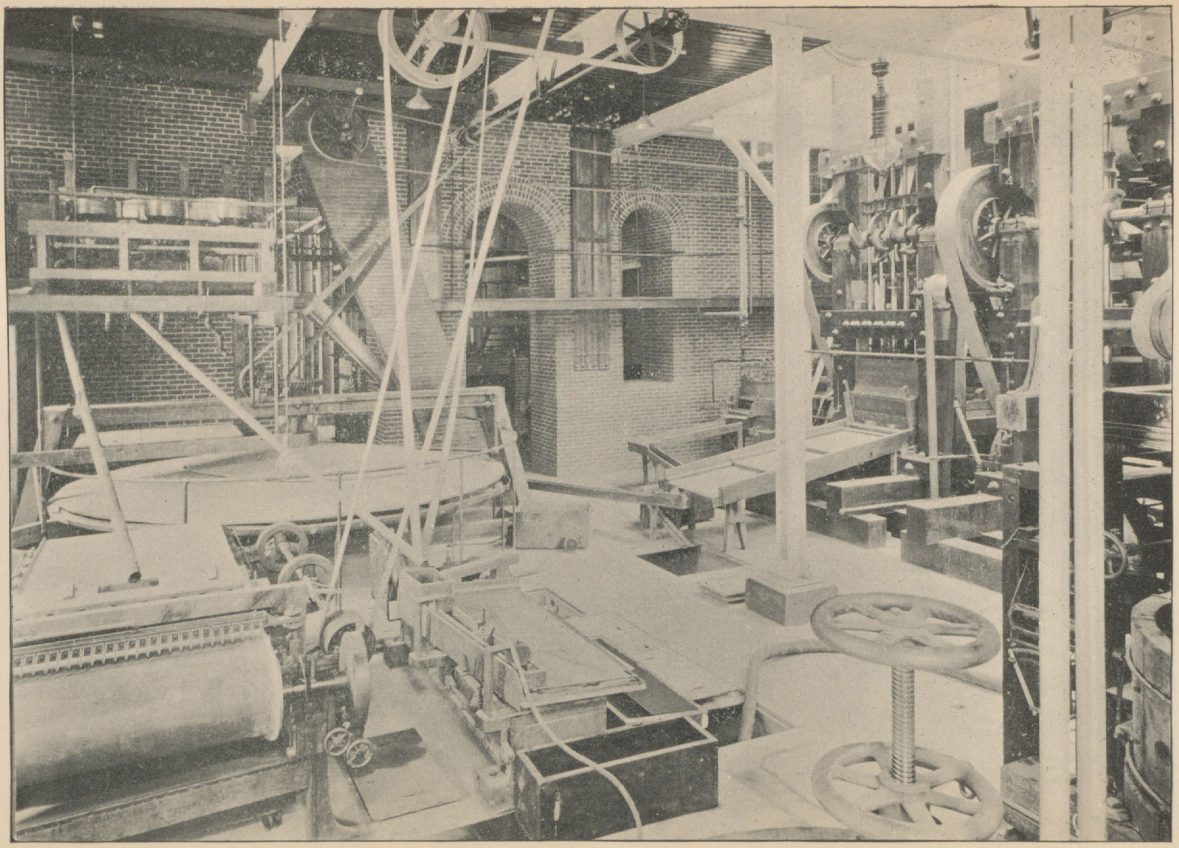
(7). Mining Colloquium. One hour a week throughout the session is given to informal discussion of the work being done in the department and of other matters relating to Mining and Ore Dressing. The men are required to take active part in these discussions.

TEXT BOOKS:—

No set text-books are used, but students are recommended to freely consult the following works of reference, in addition to the special references given from time to time :—

C. Le Neve Foster's Ore and Stone Mining; H. W. Hughes' Coal Mining; W. B. Kunhard's Ore Dressing in Europe; R. H. Richard's Ore Dressing; T. A. Rickard's Stamp Mining of Gold Ores; H. Louis' Handbook of Gold Milling; T. K. Rose's Metallurgy of Gold; M. Eissler's Metallurgy of Gold ; H. F. Collins' Metallurgy of Silver ; The Coal and Metal Miners' Pocket-book.

(8). Laboratory. One whole day and one-half day per week are given to work in the Ore Dressing and Metallurgical laboratories. In the first term this time is evenly divided between Ore Dressing and Metallurgy and certain typical operations in each are carried out either as demonstrations or by individuals or groups of students. In the second term each man is permitted to elect between Mining, Ore Dressing and Metallurgy and to chose an individual subject or thesis, and the whole of the laboratory time in the second term is given to this thesis work.



Milling Room in the Mining Department.

The set exercises in Ore Dressing comprise a series of experiments in crushing, classifying, jigging, slime treatment, magnetic separation, and amalgamation, and include a complete trial run of the five-stamp battery on a free milling gold ore.

The number of subjects available for thesis work is very great, and ranges from purely theoretical investigations in classification, concentration, etc., to the experimental determination of the best methods of treatment of ores and coals. A collection already numbering more than sixty different lots of ore is available, and the quantities are sufficient for work on a comparatively large scale.

The metallurgical work is detailed in Metallurgy 12 (9).

II. *Graduate Courses*:—Special courses in advanced work are also offered in both Mining and Ore Dressing, and these courses, owing to the unequalled equipment of the new laboratories, as detailed below, can be made exceedingly valuable both theoretically and practically.

III. *Laboratories.*—The admirable laboratories of the University are of peculiar advantage to students in the Mining Course, and enable them not only to become acquainted with the theory of their subject, but to personally investigate its methods on a large scale.

During the first three years of the course, the students do systematic work in the several workshops and laboratories of the other departments. During the last half of the Third and the whole of the Fourth Year they spend a large proportion of their time in the special laboratories for Ore Dressing and Metallurgy. (See § XII). In these, the general method is first to conduct before the whole class a limited number of important typical operations in ore dressing and metallurgy, and then to assign to each student certain methods which he must study out in detail, and upon which he must experiment and make written report. In this work he is guided by the professors and demonstrators, and assisted by the other students, each of whom he must in

turn assist in his special work. In this way every student acquires detailed knowledge of certain typical operations and a fair general experience of all of the important methods in use.

IV. *Illustrations, Museums, Societies, Etc.*—In addition to a large series of lantern slides, the department owns a collection of about twenty-five hundred photographs and other illustrations, the most important of which are kept in sets and sold at cost price, to such students as wish to retain them. This collection is constantly being enlarged.

The Museums of the new building contain suites of ores, fuels and metallurgical materials, models of mines and furnaces, and specimens of finished products.

The McGill University Mining Society meets fortnightly to read and discuss papers by graduate and student members, and from time to time to hear lectures given by gentlemen eminent in the profession.

The Society has recently been made a students' section of the Canadian Mining Institute, and its undergraduate members are therefore student members of the Institute, and receive all its publications. Papers read before the Mining Society may be entered in competition for any students' prizes offered by the Institute. See p. 167.

VI. *Summer School in Mining.*—The summer vacation class in Mining instituted in 1897 is now a fixed part of the course. All students of Mining in regular course are required to attend this class at the end of the Third Year.

The school lasts about six weeks. Of this period about one-sixth is given to field work in Geology, one-half to Mining work proper and the remainder, when practicable, to an examination of metallurgical establishments and ore dressing and milling plants. The Professor of Mining and his assistant go with the party and hold daily demonstrations or classes. The students take notes and sketches on the ground, and afterwards are required to work up these notes and to submit a formal report on some part or the whole.

The work in Metallurgy and Geology is carried on by officers of these departments, who attend the school for this purpose, and in certain cases it may be found practicable to permit students especially interested in these subjects to substitute additional work in them for a portion of the mining.

In 1898 the school was held in the coal region of Cape Breton and the gold region of Nova Scotia. In 1899 the anthracite region of Pennsylvania and metallurgical works at Bethlehem and Philadelphia, Pa., and Perth Amboy, N.J., were visited. In 1901 the school was held in British Columbia, and the most important camps were studied. In 1902 it is proposed to again visit Cape Breton.

The instruction given during this summer course is free to all mining students, the only expense to them being the cost of board, lodging, and railway fares, and every effort is made to keep these expenses as low as is practicable.

As some students may have difficulty in finding even this sum in addition to the cost of the regular course, a fund has been provided by Sir William Macdonald, and deserving students who require aid can have money advanced them by applying to the professor of mining.

16. Surveying and Geodesy.

PROFESSOR :—C. H. MCLEOD.
ASSISTANT PROFESSOR :—J. G. G. KERRY.

This course is designed to give the student a theoretical and practical training in the methods of land and geodetic surveying, in the field work of engineering operations, and in practical astronomy. The course is divided as follows :—

Second Year.—Chain and angular surveying : the construction, adjustment, use and limitations of the various instruments. Underground surveying. Topography, levelling, contour surveying. Simple curves and setting out work. Descriptions for deeds. General land systems of the Dominion and Provinces. Mr. Kerry.

Third Year.—Construction surveying, including the location of roads, transition curves, setting out work and calculation of quantities. Geodetic, trigonometric and barometric levelling. Topographic and photographic surveying. Hydrographic surveying. Introduction to practical astronomy. Graphical determination of spherical triangles, spherical projections, construction of maps. Mathematical perspective and the perspective of shades and shadows. Professor McLeod.

In the field the students of the Second and Third Years are required to carry out the following :—()1 A chain survey. (2) A chain and compass survey. (3) A pacing survey. (4) A compass and micrometer survey. (5) A contour survey. (6) A plane table survey. (7) A survey and location of a line of road with determination of topography and contours and subsequent staking out for construction. (8) A hydrographic survey of a river channel, including measurement of discharge. (9) A survey at night illustrating underground methods. Astronomical observations with sextant and engineer's transit.

All students are required to keep complete field notes, and from them prepare maps, sections and estimates of the work.

The large drawing rooms are furnished with fixed mountings for the various instruments, in order to permit of their use and investigation during the winter months.

Fourth Year.—Practical Astronomy :—the determination of time, latitude, longitude and azimuth. Geodesy:—figure of the earth; measurements of base lines and triangulation system; adjustments and reductions of observations.

The field work of the Fourth Year consists in the measurement of a base-line, in triangulations and precision levelling.

The practical work in astronomy (for equipment of observatory see § XII, 6) comprises : (1). Comparisons of clocks and chronometers. (2). Determination of meridian by solar attachment. (3). Meridian, latitude and time by solar and stellar observations with the engineer's transit. (4). Lati-

tude and time by sextant. (5). Time by astronomical transit. (6). Latitude by zenith telescope. (7). Latitude by transit in prime vertical.

Field work is required of all students of the Second and Third Years in the courses of Civil and Mining Engineering, of the Third and Fourth Years of the Architectural course, and of the Fourth Year in the Civil Engineering course. The work will begin in 1902 on 25th August, and continue for a month. The Surveying School will this year be held near Melbourne, P.Q., where a camp will be established for the accommodation of the classes.

Exercises in the Geodetic laboratory (for equipment see § XII, Art. 6, p. 224) carried out in the Fourth Year include the following: (1) Measurement of magnifying power. (2) Determination of vernier errors. (3) Errors of graduation. (4) Measurement of eccentricity of circles. (5) Determination of errors of run of theodolite miscroscopes. (6) Investigation of the errors of a standard bar. (7) Graduating scales with the dividing engine, and comparison thereof on the comparator. (8) Investigation of the errors of circles on the circular comparator. (9) Determination of the constants of steel tapes. (10) Investigation of the graduation errors of steel tapes on the fifty-foot comparator. (11) Investitgation of the errors of aneroid barometers. (12) Investigation of the errors of level tubes, and determination of their scale values. (13) Measurement of the force of gravity with a reversible pendulum.

The equipment of the surveying department comprises the following, in addition to the apparatus of the Observatory and Geodetic Laboratory:—Twenty-four transit theodolites by various makers, with solar and mining attachments. A photo-theodolite, 8-in. alt-azimuth. Fifteen dumpy and five wye levels. Hand levels and clinometers. Two precision levels. Eight surveyor's compasses. One miner's dial. Three prismatic compasses. Pocket compasses. Two solar compasses. Three marine sextants. Artificial hori-

zons. Six box sextants. Two reflecting circles. Two large plane tables. Four traverse plane tables. Four current meters. Rochon micrometers. Double image micrometers. Field-glasses. Two heliotropes. Several barometers. 300 ft. and 500 ft. steel tapes suitable for base measurements. Steel chains and steel bands. Linen and metallic tapes. Sounding lines. Pickets. Levelling rods. Micrometer targets. Slope rods. Pedometers. Station pointer, pantographs, planimeter, slide rules and minor appliances.

Examinations for Land Surveyors:—Any graduate in the Faculty of Applied Science, in the Department of Civil Engineering and Land Surveying, may have his term of apprenticeship shortened to one year for the profession of Land Surveyor in Quebec or Ontario or for the profession of Dominion Land Surveyor.

TEXT BOOKS:—

Gillespie's Surveying, Johnson's Theory and Practice of Surveying, Shortland's Nautical Surveying, Green's Practical and Spherical Astronomy, Nautical Almanac, Baker's Engineers' Surveying Instruments.

Transportation.

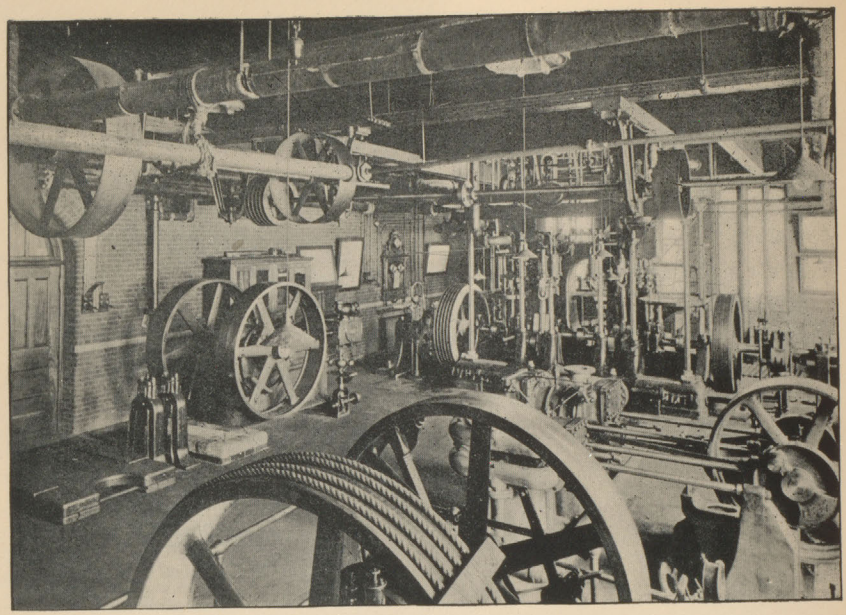
On Common Roads, Railways and Canals.

The lectures will embrace :—

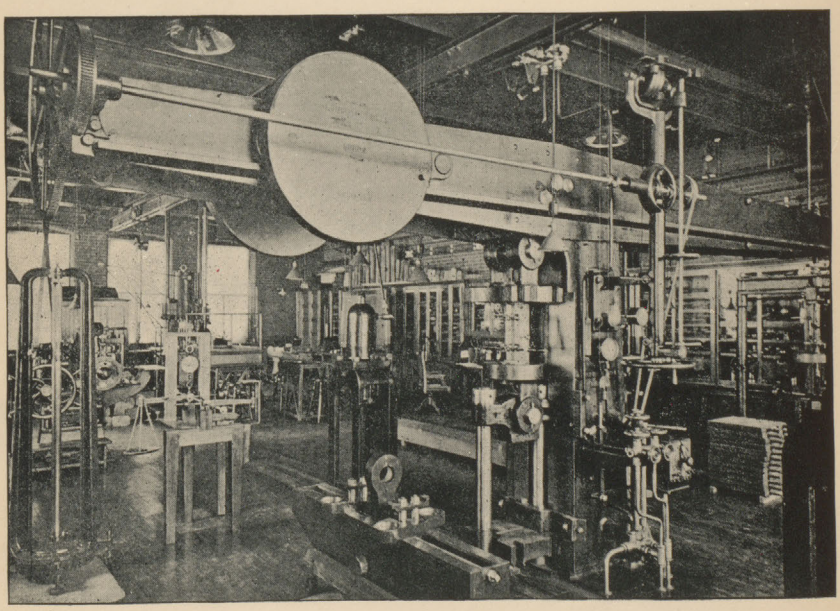
(*a*) A brief historical review of the inception and carrying out of the great Canadian systems of transportation, and a resumé of the laws governing them.

(*b*) Common roads and streets.—Provision made for them in settling up land; the traffic for which they are suited, and the cost of hauling it over different surfaces; the materials used in their construction, and the merits and cost of the various systems.

(*c*) Canals and rivers.—The Canadian canal system, the methods and costs of construction and maintenance, the traffic it is designed to carry, and the cost of transportation.



Thermodynamic Laboratory.



An Engineering Testing Laboratory.

(*d*) Steam railroads.—The traffic they serve and the cost of handling it, the details of location and the influence of physical features and trade possibilities upon it, the cost and design of construction, the duties of the engineer upon such work, the appliances at present in use for safe and speedy handling of trains.

(*e*) Electric roads.—The traffic which they now carry, their location and construction, the reasons for their rapid extension, and their probable future.

The questions of the development and applying of motive power and the various appliances, mechanical and electrical, now in use for these special purposes, are taken up in special descriptive lectures in the mechanical and electrical departments. Mr. Kerry.

17. Thermodynamics.

LECTURER :—R. J. DURLEY.
DEMONSTRATOR :—H. M. JAQUAYS.

The course in this subject extends over the Third and Fourth Years, and includes the following :—

Third Year—(Monday, 11; Tuesday, 10.)—Fundamental laws and equations of Thermodynamics; their application to gases and to vapours, saturated and superheated. Efficiency of ideal heat engines. Properties of steam, and elementary theory of the steam engine. Elementary theory of gas and hot air engines.

Fourth Year—(Monday, 12 ; Thursday, 11.)—Theory of reversed heat engines and refrigerating machines. Entropy and Entropy-Temperature diagrams. A thermodynamic study of the steam engine, including the behaviour of steam in the cylinder. Economy of steam engines. Influence of size, speed, and rate of expansion. Compound expansion. The steam jacket. The testing of steam engines. More advanced theory of gas, air, and oil engines.

The advanced course is carried out as far as possible in connection with the experimental work of the Thermodynamic Laboratory.

TEXT BOOKS:—

Ewing's Steam Engine (Cambridge Univ. Press) ; Peabody's Tables of Properties of Steam (Wiley).

18. Summer Term Art Classes.

Classes in Drawing, Painting and Modelling, open to both men and women students, will be held in the rooms of the Architectural Department, under the direction of Mr. Henry F. Armstrong, commencing May 1st, and continuing until June 30th.

The rooms will be open on week-days from 10 a.m. to 5 p.m.

Students may pursue their studies in one or more of the subjects continuously every day.

Teaching and criticism will be given daily during the above hours, except on Saturdays.

I. *Freehand Drawing* :—
   (*a*) In lead-pencil and in charcoal, for students preparing for, or engaged in, any branch of art work.
   (*b*) In lead-pencil, for engineering and other science students.

II. *Oil Painting and Water Colour Painting.*

III. *Modelling in Clay and Casting in Plaster.*

Fees.

Full Term.—$25.00, whole day; $15.00, *half day.

One month of 4 weeks, commencing any time during the term; $15.00, whole day; $9.00, *half day.

Note.—Any period more than a month, but less than the term, will be charged for at the rate per month.

Fees are payable in advance at the office of the University Bursar.

19. Special Lectures.

During session 1901-2, the following special lectures were delivered under the auspices of the University and of the Applied Science Graduates' and Mining Societies :—

R. B. Rogers, M. Can. Soc. C.E., on " The Trent Canal."

(* Half day means morning *or* afternoons, not interchangeable.)

E. P. Mathewson, B.A.Sc., on "The Mineral Resources of Northern Chili."

F. D. Adams, Ph.D., M.Sc., on "Flow of Rocks."

J. B. Porter, PhD., on "Gold Dredging."

E. Rutherford, M.Sc., on "Wireless Telegraphy."

A. Stansfield, D.Sc., on "The Electric Furnace," and on "The production and uses of aluminium."

N. Norton Evans, M.Sc., on "The Summer Mining Trip to British Columbia."

J. Cox, M.A., a special course of lectures to advanced and graduate students, on "Relations between Optics and Electricity."

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§ XII. Laboratories

In the Laboratories the Student will be instructed in the art of conducting experiments, a sound knowledge of which is daily becoming of increasing importance in professional work.

1. Assaying Laboratory. See Mining and Metallurgical Laboratories.

2. Astronomical Observatory. See Geodetic Laboratory.

3. Cement Laboratory.—The importance of tests of the strength of mortars and cements is very great. The equipment of the Laboratory for the purpose is on a complete plan, including :—

(*a*) Three one-ton tensile testing machines, representing the best English and American practice.

(*b*) One 50-ton hydraulic compressive testing machine.

(*c*) Volumenometers for determining specific gravity and for determining the carbonic acid in the raw material.

(*d*) Faija steaming apparatus for blowing tests.

(*e*) Mechanical hand and power mixers.

(*f*) Apparatus for determining standard consistency.

(*g*) Vicats' and Gilmore's needles for determining set.

(*h*) Weighing hopper, spring and other balances.

(*i*) Gun metal moulds for tension, compression and transverse test pieces, and special moulds for placing mortar into the moulds under a uniform pressure, which, together with the mechanical mixers, enable the personal errors to be eliminated.

(*j*) Sieves of 20, 30, 40, 50, 60, 70, 80, 100, 120 and 180 meshes per lineal inch for determining the fineness.

(*k*) A Boehme hammer, with all accessories.

The laboratory is also fitted with copper-lined cisterns, in which the briquettes may be submerged for any required time, and with capacious slated operating tables, bins and tin boxes for keeping the cement dry for any period.

In the Cement Testing Laboratory, researches have been made on the strength of mortars set under pressure, the effect of frost on natural and Portland cements, the effect of sugar on lime and cement mortars, the strength of lime and cement mortars and of the bricks in brick piers, the effect of fine grinding on the adhesive strength of

cements, of using hot water in mixing mortars. Continued tests on the strength of concrete blocks in series are made by Fourth Year Students.

In addition to these researches, a large amount of work is done each year by the Third Year students, in investigating the specific gravity, fineness, setting properties, constancy of volume, and the tensile, comprehensive and transverse strengths of cement, both neat and with the sand.

4. Chemical Laboratories.—The main lecture-theatre, extending through two storeys, is entered from the ground floor, and seats nearly 250 students. The lecture-table is supplied with coal-gas, oxygen and hydrogen, electricity, water, vacuum, down-draught, etc., and can be well seen from all parts of the room.

Besides the main lecture theatre there are three smaller class rooms, accommodating from 40 to 60 students each.

The three principal laboratories have each a floor-space of about 2,400 square feet, and together have accommodation for nearly two hundred students working at a time. They are lighted on three sides, and have ample hood space. One is intended for beginners, and the others for more advanced work, particularly in qualitative and quantitative analysis. In connection with each of the main laboratories is a balance-room, equipped with balances by several of the best makers.

Physical Chemistry is provided for in a special laboratory, nearly 30 by 40 feet, lighted from the north, and supplied with electricity, steam, vacuum pumps, etc. The equipment of this department consists of the apparatus necessary for the determination of the specific gravities of solutions, of the depression of freezing point, and the rise of boiling point, of the densities of gases and vapours. There are constant-temperature baths for accurate measurement of solubilities, Kohlrausch's apparatus for determining the electrical conductivity of solutions, and the apparatus necessary for measuring the electromotive forces generated between metals and their solutions, and in voltaic cells generally. There are also calorimeters for measuring the heat effects produced in chemical reactions. There is on the same floor an optical room furnished with refractometers for measuring the refractive indices of solutions, goniometers, polariscopes and spectroscopes. Other forms of apparatus will be added as required for research work.

Immediately adjoining the laboratory of Physical Chemistry is the Photographic department, supplied with two dark rooms, arranged on the maze system, and provided with the necessary appliances for all ordinary photographic work, including an enlarging camera. Apparatus for micro-photography has recently been added to the equipment.

The laboratory for gas analysis has a northern exposure, and is fitted with a large tank to contain water at the temperature of the room, for use in obtaining a constant temperature in the measurement of gases. The tables are arranged for work with mercury, and the laboratory is supplied with the apparatus of Hempel, Dittmar, Orsat, Elliot, and others. It contains also Fleuss, Boltwood, and Töpler pumps for producing high vacua.

The laboratory for electrolytic analysis is supplied with accumulators, thermopile, platinum electrodes, rheostats, ammeters, voltmeters, etc.

Another room has lately been equipped with electric furnaces and other appliances for electro-chemical work.

The organic department comprises a laboratory for preparations and research, a combustion room for analysis, a dark room for polariscope and saccharimeter work, and a lecture room. The laboratory is fitted with all the necessary apparatus for organic research—special hoods for work with poisonous gases, regulating ovens for

digesting and drying at various temperatures, filter presses for the extraction of raw materials, and various forms of apparatus for distillation in vacuo. The dark room is equipped with polariscopes and saccharimeters for sugar work. There is a large supply of the necessary organic chemicals, which are supplied free of charge to students engaged in routine or research work in this department.

The laboratory for determinative mineralogy has places for 28 students, and is supplied with abundant material for practical work. It adjoins the lecture-room, in which the lectures in advanced mineralogy are delivered. The mineralogical department is also provided with suitable machinery, run by electricity, for use in the cutting and polishing of minerals and rocks.

The Library contains a valuable collection of the most recent English, French, and German books, and sets of various journals and transactions, including the Berichte der Deutschen Chemischen Gesellschaft, Journal für praktische Chemie, Chemisches Centralblatt, Fresenius' Zeitschrift für Analytische Chemie, Annales de Chemie et de Physique, Journal of the Chemical Society, Chemical News, Mineralogical Magazine, Mineralogische und Petrographisiche Mittheilungen, etc. The library is open to students under such restrictions as are necessary to prevent damage or loss of books.

The rooms for allied purposes have, as far as possible, been grouped together on the same floor, and there is a hydraulic lift running from the basement to the attic. The offices and principal laboratories and supply rooms are also connected by a system of telephones. The building is practically fire-proof.

5. Electrical Laboratories.—These laboratories contain all principal types of commutating, synchronous, and induction machinery, together with ample facilities for investigating their action. The several Laboratories are the Standardizing Laboratory, the Dynamo Laboratory, the High Tension Testing Room, the Photometer Room, and the Laboratory for special investigation.

(*a*) The Standardizing Laboratory is equipped with four Kelvin Balances for alternating and direct current measurements, best range .025 to 600 amperes; a Kelvin standard electrostatic multicellular voltmeter, Board of Trade pattern; a Weston laboratory standard Ammeter, range with shunts 0 to 1500 amperes; a Weston Laboratory standard Voltmeter range with multipliers, 0 to 3000 volts; special Weston alternating current voltmeters and wattmeters; a special Elliott Potentiometer with standard cells for electromotive force and current measurement; means for measuring high and low resistances, capacity, and di-electric strength of insulating materials, etc., etc. Direct current for the Laboratory is furnished either from the service plant, from a special motor-dynamo, the voltage of which can be continuously varied from 0 to 10 volts,, current capacity 300 amperes; from a 75 K.W. hour storage battery arranged in sections, or from any d.c. machine in the Dynamo Laboratory. Alternating current of several wave shapes and frequencies up to 150 periods per second, and voltages up to 200,000 is available. A special transformer having a current capacity of 800 amperes is used for alternating current ammeter calibration. For alternating current voltmeter calibration, a special regulator is provided, by which voltages from 0 to 200 can be obtained in as small steps as desired.

(*b*) The Dynamo Laboratory. This Laboratory consists of two sections, one devoted to direct current work, and the other to alternating current work. The former method of driving all dynamos from an overhead line shaft and clutch pulleys has been abandoned and individual motors supplied for each machine. Each motor is provided with suitable series turns and variable shunt, the whole being connected to act with or against the shunt turns, as a compounding or differential effect is desired. The speed of the motors

can be varied about 50 per cent. by field rheostat. This gives perfect control of dynamo speed. Current for operating is obtained from six independent sources of supply; one 75 K. W. direct connected unit in the service plant; 3 sets of 25 K. W. hour chloride accumulators and two city supply circuits. All dynamos and motors are mounted on strong testing benches fifteen inches high, with slotted floor, so that any machine can be placed anywhere on the benches and secured in place. Two small travelling cranes over the benches allow machines to be easily shifted. All wiring is done in conduits under the floor, and large sectional switchboards are provided for current distribution about the laboratories. Special testing tables, permanently wired up and fitted with circuit breakers, switches, etc., facilitate the work. Twenty-five commutating machines, generators, motors, boosters, motor-generators, dynamotors, converters, closed and open coil arc machines, varying in capacity from a fraction of a kilowatt to 75 kilowatts, of many different types and makes, are provided for direct current testing. Twelve alternating current machines, including generators, synchronous motors, compensators, and synchronous converters, together with a large amount of stationery and rotary induction apparatus, are provided for alternating current work. Several of the alternating current dynamos are of the inductor type and several different shaped inductors are provided with each machine to give different wave forms. A specially arranged induction motor serves as a frequency changer. The laboratory is also provided with between eighty and ninety voltmeters, ammeters, and wattmeters of standard make and of different ranges; condensers, rheostats, standard resistances, etc.

(*c*) High Tension Testing Room. This room is equipped with four 10 K.W., 200-50,000 volt. transformers with switch board and suitable controlling devices. The voltage can be varied in small steps by means of a Stillwell regulator inserted in the primary and by varying the field of the dynamo supplying current. A Kelvin direct reading electrostatic voltmeter, range 100-100,000 volts., gives a means of measuring high voltages directly.

(*d*) The Photometer Room. This room is equipped with standard photometric apparatus for candle power measurements on arc and incandescent lamps.

(*e*) The Laboratory for special investigation adjoins the Standardizing Laboratory. Meter and transformer testing are also done in this room.

6. Geodetic Laboratory.—The equipment of this laboratory consists of :—

(1) Linear instruments.

(*a*) A Rogers comparator and standard bar for investigating standards of length.
(*b*) A fifty-foot standard and comparator for standardizing steel bands, chains, tapes, rods, etc.
(*c*) A Whitworth end-measuring machine and set of standards.
(*d*) A Munro-Rogers linear dividing engine.

(2) Circular instruments.

(*a*) A Rogers' circular comparator and dividing engine.
(*b*) Two level triers.

(3) Time :—

(*a*) An astronomical clock and clock circuit in connection with the observatory clocks.
(*b*) Chronometers running on mean and sidereal time.
(*c*) Chronograph.

(4) Gravity.—A portable Bessel's reversible pendulum apparatus with special pendulum clock and telescopic apparatus for observing coincidences of beats.

(5) A water gauge apparatus for testing aneroid barometers.

(6) Magnetic instruments :—

(*a*) A Kew dip circle.
(*b*) A Kew filar magnetometer.

The laboratory is constructed with double walls and enclosed air spaces, and has a special heating apparatus, so that the temperature within may be brought to, and held at, any desired degree.

The ordinary course of instruction in this laboratory is described in § XI., Art. 14.

Astronomical Observatory.—The observatory equipment for the purpose of instruction in practical astronomy consists of :—

1. A Bamberg prismatic transit with zenith attachment.
2. Two astronomical transits for meridian observations. Collimating telescopes.
3. A Troughton & Simms' zenith telescope.
4. An astronomical transit in the prime vertical.
5. Sidereal and mean time clocks and chronometers.
6. Chronograph and electrical circuits by which observations and clock comparisons within or without the observatory may be made.

7. Hydraulic Laboratory.—Here the student will study practically the flow of water through orifices of various forms and sizes, through submerged openings, over weirs, through pipes, mouthpieces, etc.

The equipment of this laboratory includes :—

(*a*) A large Experimental Tank, 30 ft. in height and 25 sq. ft. in sectional area. With this tank experiments are conducted on the flow of water through orifices either free or submerged. By a simple arrangement the orifices can be rapidly interchanged without lowering the head, and with the loss of only about one pint of water. The indicating and measuring arrangements connected with the tank are exceedingly delicate and accurate, all times being automatically recorded by an electric chronograph, and valuable results have already been obtained. By means of a special connection with the city water-supply, the available head of water may be increased up to 280 ft.

(*b*) An Impact Machine, which renders it possible to measure the force with which water flowing through an orifice, nozzle, or pipe, strikes any given surface, and also the impulsive effect of the water entering the buckets of hydraulic motors.

(*c*) A Rife's Hydraulic Ram.

(*d*) A Jet Measurer specially designed for investigating the dimensions of the jet produced in the phenomena known as "the inversion of the vein." With this apparatus it is possible to determine, within .001 inch, the dimensions of a jet in any plane and at any point of the path.

(*e*) Numerous orifices, nozzles, and mouth-pieces.

(*f*) A specially designed stand-pipe, with all the necessary connections for pipes of various sizes for investigations on frictional resistance. The pressures are measured by recording gauges, etc.

(*g*) A flume about 35 feet in length, by 5 ft. in width by 3 ft. 6 ins. in depth.

(*h*) Weirs up to 5 ft. in width, and with a depth of water over the sill varying from nil to 8 inches. A weir-depthing machine, with three adjustable heads, gives the surface depth of the stream at any three points in a transverse section. The velocity of the stream is also determined by means of a double Pitôt tube.

(*i*) Numerous hydraulic pressure-gauges.

(*j*) A mercury column 60 feet in height.

(*k*) Gauge-testing apparatus.

(*l*) Various rotary, and piston meters, and a Venturi meter.

(*m*) Apparatus for illustrating vortex motion.

(*n*) Apparatus for illustrating vortex ring motion, and for deter-

(*o*) Five specially built gauging tanks with suitable indicators, mining the critical velocity of water flowing through pipes. each having a capacity of 800 cubic feet. Also other portable tanks.

(*p*) Transmission and absorption dynamometers.

(*q*) An experimental centrifugal pump, which can be tested with varying heights of suction and discharge.

(*r*) An inward-flow turbine, a new American turbine, an outward-flow impulse turbine, a Pelton, and other motors and turbines.

(*s*) Standard gallon and litre measures with glass strikes. This Laboratory is also provided with a set of pumps, specially designed for experimental work and research. They are adapted to work under all pressures up to 120 lbs. per sq. in., and at all speeds up to the highest found practicable. The set is composed of three vertical single acting plunger pumps of 7 in. diam., 18 in. stroke, driven from one shaft. They have two interchangeable valve chests, and it is arranged that both the valves and their seats may be removed and replaced by others. The pumps are also provided with a double set of continuous recording indicators designed in the laboratory and having electrical connections. With these, an accurate record of the suction and discharge valves may be obtained at any given time, all fluctuations of speed, pressure, etc., being automatically recorded.

8. Mechanical Laboratory.—The equipment of this Laboratory includes:—A belt-testing machine, capable of taking a six-inch belt at 15 feet centres. The machine includes a special hydraulic dynamometer, and a friction brake, and will absorb 15 H. P. A Thurston railway-pattern oil-tester, fitted with water cooling and heating apparatus for varying the temperature of the brasses as desired. An Engler standard viscosimeter, and other necessary apparatus for the physical testing of lubricants. A specially designed hydraulic support and fittings for carrying out experiments on the action of cutting tools in the lathe. Apparatus for experiments on the efficiency of pulleys and hoisting appliances, and on the efficiency of worm and other gearing. Apparatus for governor-testing.

This Laboratory is used in connection with the courses in Mechanical Engineering subjects.

9. Metallurgical and Assaying Laboratories.—These consist of a large furnace room of 2,200 sq. feet for metallurgical operations, a furnace room for assaying of 1,300 sq. feet, a balance room, small analytical laboratory and part of another room which is utilized for pyrometric and photo-microscopic work. The furnace room is fitted with a water-jacket blast-furnace, 24 inches inside diameter, for smelting lead and copper ores; also a hand reverberatory furnace for roasting ores, having a hearth 14 ft. by 6 ft., a Brückner roasting furnace and an English cupellation furnace.

It has also a large lead-lined chlorination-barrel for high pressures, with filter press, air pump, etc., and a number of vats for chlorination cyanide extraction, and leaching of gold or other ores.

The furnace room adjoins the milling and ore dressing room (see page 227) and ores which have been crushed and dressed can easily be conveyed into the furnace room for roasting, smelting or leaching treatments.

In addition to this comparatively large scale plant, apparatus is being provided to enable the students to study in detail the more important metallurgical operations using quantities of ore or metallurgical products of usually not more than a few pounds in weight. With such appliances the work of the student can be of a more individual character than is generally possible with large scale plant, and the reactions which occur can be more easily and exactly studied.

For the purpose of small scale work there is a large crucible furnace which can be used with either natural or forced draught, a large gas furnace which can be used either as an oven furnace or a muffle furnace, and a number of small muffle and crucible furnaces in the assaying laboratory.

In the autumn of 1901 the students erected a model brick blast furnace, and used it successfully for smelting copper ores. A Roots blower has been provided for the blast furnaces, and connections for supplying forced draft have been made to the gas and reverberatory furnaces. Electric furnaces are being constructed for carrying on operations at very high temperature, and there is a low voltage motor dynamo and storage battery for electrolytic work. Leaching operations on a small scale are conducted in stoppered bottles which can be agitated by machinery.

A powerful hydraulic press and a piece of apparatus for compressing gases by hydraulic power are available for experiments that have to be conducted under great pressure.

The Assaying Laboratory is equipped with a large soft coal assay furnace, and with a number of small muffle and crucible furnaces fired with coke; the large gas muffle furnace in the furnace room is also available for assaying purposes, and there is a small muffle furnace and a crucible furnace fired by gasoline.

Adjoining the assaying laboratory, is the balance room and a small laboratory for chemical work.

In another room are a number of electrical pyrometers of both the Le Chatelier and Callendar type, and a micro-photographic outfit for recording the microscopic structure of metals and alloys. A polishing machine, worked by power, has been installed to prepare the specimens for examination.

The courses of instruction in these laboratories are described in § 12.

10. Mining and Ore-Dressing Laboratories. — The Department of Mining Engineering has one large laboratory for ore-dressing and a nnmber of rooms of moderate size equipped for use as special laboratories, offices, lecture room, dark room, machine shop, etc. Te effective floor space is about 6,600 square feet, in addition to which the departmental store rooms, ore bins, etc., have an area of 1,000 feet.

The ore-dressing laboratory proper has about 4,200 feet of floor space and is 25 feet high in the centre.

It is equipped with two classes of apparatus. First, a large number of pieces especially designed for individual work on a small scale. Many of these are for elementary investigations and demonstrations of a theoretical nature, others are small scale reproductions of typical ore-dressing and milling machines. Second, a complete plant of standard apparatus for crushing, sampling, milling, concentrating and coal washing. The apparatus last mentioned has been chosen from the best designs in common use and each important class of ore-dressing machinery is represented by two or more different types in order that comparative tests may be made. Each machine is so arranged that it may be used, tested and cleaned up independently, but when expedient, a number of machines can be connected by automatic conveyors and thus complete working plants

of many kinds can be improvised, each of sufficient capacity to test large lots of material under approximately working conditions.

The chief pieces of apparatus in the laboratory are rock-breakers of three kinds, Blake, Dodge and Comet, for coarse crushing; Stamp mills of 600 and 950 lbs., respectively, for the fine crushing and amalgamating of gold ores; Huntingdon centrifugal roller mill, for crushing and amalgamating; high speed steel rolls for fine crushing; Gates' grinder for preparing samples, and a ball mill for extremely fine grinding.

Following these there is a Bridgman automatic sampler and a series of trommels and hand and power shaking screens for sizing the crushed ores; two specially designed jigs of two and four compartments, with adjustable eccentric, cam and slide mechanisms, and several small hand and power jigs for coarse concentration: revolving, bumping and stationary glass tables; Frue vanner, Wilfley table, etc., for separating valuable minerals contained in fine sands and slimes; plates, pans, and barrels for amalgamating gold and silver ores; spitzkasten, spitzlütte, magnetic separators, coal washers, dolly tubs, and various other special pieces of ore-dressing apparatus.

An hydraulic lift and a complete series of belt and bucket elevators, feeders, samplers, etc., are provided for use in heavy, continuous work. The motive power used is electricity, generated in the University power and light station, and utilized through a number of electric motors conveniently placed near the machines to be operated. The department is equipped with the most approved apparatus for electrical measurements, and is thus able to make frequent and accurate determinations of the amount of power used by each machine, and for any especial condition of use.

In addition to the main laboratory there are excellent facilities for advanced and research work—including a thoroughly equipped analytic and assay laboratory and a photographic room. The department possesses an excellent Fuess petrographical microscope, a good set of weighing and measuring devices, and a number of pieces of special apparatus for advanced theoretical investigation.

The courses of instruction in these laboratories are described in XI., 15.

11. Petrographical Laboratory—The Petrographical Laboratory, containing the chief rock collection of the University, is situated in the Chemistry and Mining building. It is arranged for the use of Students in the Mining Course as well as for those desiring to take advanced work, and is provided with a number of petrographical microscopes by Seibert, Crouch, and Fuess, as well as with models, sets of thin sections, electro-magnets, heavy solutions, etc., for petrographical work.

A collection of typical rocks has been especially prepared for the use of students, and a complete equipment for cutting, grinding, and polishing rocks, has been installed, which runs by electric power and gives excellent facilities for the preparation of thin sections for microscopic use.

For advanced work and petrographical investigation Dr. Adams' extensive private collection of rocks and thin sections is available for purposes of study and comparison.

12. Physical Laboratory.—The equipment of the Macdonald Laboratories comprises: (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the students in practical work; (3) the most recent types of all the important instruments for exact measurement, to be used in connection with special work and research.

The basement contains the cellars, furnaces, and janitor's department at the west end of the building. The machine room—containing a small gas engine and dynamo, which are fitted for testing, but can also be used for light and power, a motor-alternator and a motor-dynamo—is situated at the extreme western corner of the basement so as to be as far removed as possible from the delicate magnetic and electrical instruments. Here is also the switch-board for controlling the various circuits for supplying direct or alternating current to different parts of the building. The Accumulator Room contains a few large storage cells, charged by the motor-dynamo, which are fitted with a suitable series-parallel arrangement, and with rheostats for obtaining and controlling large currents up to 4,000 amperes for testing ammeters and low resistances, etc.

The Magnetic Laboratory contains magnetic instruments and variometers of different patterns, and also a duplicate of the B. A. Electro-dynamometer, which has been completely remodelled and set up with great care for absolute measurement of current. The Laboratory, on the opposite side of the basement, contains a very fine Lorenz apparatus for the absolute measurement of resistance, constructed under the supervision of Prof. Viriamu Jones. It also contains a set of Ewing Seismographs and a pair of Darwin Recording Mirrors for measuring small movements of the soil.

There is a constant Temperature Room, surrounded by double walls, which contains a Standard Rieffler Clock, and is fitted for comparator work.

The Ground Floor contains at the western corner a small machine shop, fitted with a milling machine and suitable lathes and tools driven by electric motors, and such appliances as are required for the making and repairing of the instruments, for which the services of a mechanical assistant are retained. There is also a store room for glass, chemicals, and cleaning materials, and extensive lockers and lavatories for the use of the students.

The Main Electrical Laboratory is a room 60 feet by 40, and is fitted with a number of brick piers, which come up through the floor, and rest on independent foundations, in addition to the usual slate shelves round the walls. This room contains a large number of electrometers, galvanometers, potentiometers and other testing instruments of various patterns, and adapted for different uses. It connects with a smaller room at the side, in which are kept the resistance boxes and standards, and also the capacity standards. A small research laboratory adjoining the electrical laboratory, is fitted up for the study of electrical discharge in high vacua, and for work with Röntgen and uranium radiation, and with ultra-violet light.

The First Floor contains the Main Lecture Theatre, with seats for about 250 students. The lecture table is supported on separate piers, which are independent of the floor. Complete arrangements are provided for optical projection and illustration. The Preparation Room in the rear contains many of the larger pieces of lecture apparatus, but the majority of the instruments, when not in use, are kept in suitable cases in the adjoining apparatus room. On the same floor there is the Heat Laboratory, devoted to advanced work in Thermometry, Pyrometry and Calorimetry, and also to such electrical work as involves the use of thermostats and the measurement of the effects of temperature. There are also two smaller rooms for Professors and Demonstrators.

The Second Floor is partly occupied by the upper half of the Lecture Theatre. There is also an Examination Room for paper work, a Mathematical Lecture Room, with a special apparatus room devoted to apparatus for illustrating Mathematical Physics, and a special Physical Library chiefly devoted to reference books and periodicals relating to Physics. A store room, lavatories, and Professors' room occupy the remainder of the flat.

The Third Floor contains the Elementary Laboratory, a room 60 feet square, devoted to elementary practical work in Heat, Light, and Sound, and Electricity and Magnetism. There is a Demonstrator's Room adjoining, and an optical annex devoted to experiments with lenses, galvanometers and polarimeters. Also a series of smaller optical rooms, including a photometric room, specially fitted for Arc photometry, and a dark room for photographic work.

Mathematics and Dynamics. — Part of this floor, allotted to the subject of Mechanics, contains instruments for measuring length, area, volume, time, mass; Atwood machines and a Galileo Inclined Plane for the study oi the Laws of Motion; Willis Apparatus for experiments in Statics and Friction on a large scale; Simple, Kater and Ballistic Pendulums; and torsion and rotation apparatus for determining moments of inertia. The practical work in this section is arranged to run parallel with and illustrate the lectures in Dynamics delivered in the first year, and also those in the second year of the Faculty of Arts.

13. Testing Laboratories.—The principal experiments carried out in these will relate to the elasticity and strength of materials, friction, the theory of structures, the accuracy of springs, gauges, dynamometers, etc. The equipment of this laboratory includes:—

(*a*) A Wicksteed 100-ton and an Emery 50-ton machine for testing the tensile, compressive and transverse strength of the several materials of construction. To the former has been added a specially designed arrangement, by which the transverse strength of girders and beams up to 26 ft. in length can be determined. These machines are provided with the holders required for the various kinds of tests, and new holders have also been specially designed and made in the laboratory for investigating the tensile and shearing strength of timber for wire rope and belt tests, etc. Numerous attachments have also been made to the machines, which have already increased their efficiency. The most recent addition is a double-bearing support for transverse testing.

(*b*) An Impact Machine, with a drop of 30 ft., and with gearing which will enable specimens to be rotated at any required speed, and the blows to be repeated at any required intervals. By means of a revolving drum, a continuous and accurate record of the deflections of the specimens under the blows can be obtained.

(*c*) An Unwin Torsion Machine with a specially designed angle-measurer, by which the amount of the torsion can be measured with extreme accuracy.

(*d*) An Accumulator, furnishing a pressure of 3,600 lbs. per square inch, which is transmitted to the several testing machines, and ensures a perfectly steady application of stress, an impossibility when any form of pump is substituted for an Accumulator.

(*e*) A Blake and a Worthington Steam Pump, designed to work against a pressure of 3,600 lbs. per square inch. The Accumulator may be actuated by either of the pumps, and, if at any time it is desirable to do so, either of the pumps may be employed to actuate the testing machine direct. When in operation the work of the pump and the accumulator is automatic.

(*f*) Extensometers of the Ewing, Unwin, Martens, Marshall and other types. The extensometer equipment has recently been enriched by seven sets of improved extensometer apparatus designed and made in the laboratory.

(*g*) Portable cathetometers, and also a large cathetometer specially designed and constructed for the determination of the extensions, compressions and deflections of the specimens under stress in the testing machines.

(*h*) An automatic electric motor pump for actuating the Accumulator; also various electric motors for working the several machines.

(*i*) A drying oven for beams up to 26 ft. in length. The hot air in this oven is kept in circulation by means of a fan driven by an electric motor.

(*j*) Numerous gauges, amongst which may be specially noticed an Emery Pressure Gauge, graduated in single lbs. up to 2,500 lbs. per square inch. All of the testing machines are on the same pressure circuit, and are connected with the Emery gauge and also other standard gauges, including recording gauges. This arrangement provides a practically perfect means of checking the accuracy of the testing.

(*k*) Special apparatus and recording gauge for the testing of hose, etc.

(*l*) Dynamometers for measuring the strength of textile fabrics, the holding power of nails, etc.

(*m*) Apparatus for determining the elasticity of long wires.

(*n*) Apparatus for determining the hardness of materials of construction.

(*o*) Zeiss and other Microscopes.

(*p*) Delicate chemical and other Balances. A very important part of the equipment is the Oertling Balance, capable of indicating with extreme accuracy weights of from .00001 lb. up to 125 lbs.

(*q*) Apparatus for the microscopic study of metals and for microscope photography.

(*r*) Micrometers of all kinds.

During the past year the laboratory has been enriched by the addition of a number of transverse, tension, compression and torsion testing machines, so that ample opportunity is now provided for individual work on the part of every student.

The new apparatus comprises:—A transverse bending machine, which is adapted for loads up to 3000 lbs., and for beams of 10 ft. span. Small beam testing machines, which are used to illustrate the laws of the bending of beams, both when the ends are free and when they are fixed. Two small tension machines, in which experiments are made on metals, the strains being within the elastic limit. Apparatus for experiments with long wires, which has been installed in one of the vertical shafts of the Engineering Building, and is adapted for experiments on wires 60 ft. in length. A lever machine for experiments on alternate twisting. A testing machine for breaking tests on wires. A powerful hydraulic press for compression tests on metals, cements, stone, and similar materials. Apparatus for measuring strains of compression.

14. Thermodynamic Laboratory.—The Thermodynamic Laboratory is furnished with an experimental steam engine of 120 I. H. P., specially designed for investigating the behaviour of steam under various conditions; the cylinders are 6 1-2 inches, 9 inches, 13 inches, and 18 inches in diameter, and the stroke of all the pistons is 15 inches. The cylinders can be so connected as to allow of working as a simple, compound, triple, or quadruple expansion engine, either condensing or non-condensing, and with any desired rate of expansion. The jackets are so fitted as to permit of measuring independently the water condensed in the cover, barrel, or bottom jacket of each cylinder, and the engine can be worked with any desired initial pressure up to 200 lbs. per square inch. The measurements of heat are made by means of large tanks, which receive the cooling water and the condensed steam. There is an independent surface condenser and air pump. Two hydraulic absorption brakes and an alternative friction brake serve to measure the mechanical power developed.

The Laboratory also contains the following machinery:—

A Robb automatic cut-off engine, having a cylinder 10 1-2 inches in diameter by 12 inches stroke. This engine is specially fitted up for the measurement of cylinder temperatures, and can be run at speeds up to 300 revolutions per minute.

An automatic high speed engine by Macintosh & Seymour, having a cylinder 12 inches diameter by 12 1-2 inches stroke. Automatic recording apparatus, registering the load on the brake of this engine, has been constructed and fitted up during the past session.

A hot-air engine built by Woodbury Merrill of Ticonderoga.

An Atkinson "Cycle" Gas engine, having a cylinder 7 inches diameter by 8 inches stroke, and indicating 6 H. P.

An Otto gas engine (built in the workshops of the Department), having a cylinder 8 1-2 inches diameter by 12 inches stroke, and indicating 12 H. P.

A "Dake" steam engine of 4 H. P.

A two stage air compressor taking 40 H. P., and having cylinders 10 inches and 17 inches in diameter, by 15 inches stroke. This compressor delivers its air into reservoirs placed beneath the floor of the machine shop, and is provided with an intercooler whose capacity can be varied as desired.

A high speed horizontal engine having a cylinder 6 inches diameter by 9 inches stroke, and operated by compressed air.

The smaller apparatus belonging to the laboratory includes the necessary equipment of weighing machines, brakes, calorimeters, thermometers, gauges, pyrometers, fuel testers, indicators, planimeters, and a Moscrop recorder.

The boiler installation of the Engineering Building supplies steam for heating and power purposes, and is so arranged as to be available for experimental work in connection with the Thermodynamic Laboratory. It comprises boilers of five distinct types as follows:—

One Cornish boiler, for heating service, rated at 50 H. P.

One locomotive boiler, Belpaire type, 100 H. P.

One internally fired tubular boiler, 120 H. P.

Two Babcock-Wilcox water-tube boilers, each 60 H. P.

One Yarrow water-tube boiler, fitted in a closed stokehold, for working under forced draft, rated at 150 H. P.

These boilers are provided with the necessary tanks, weighing-machines and apparatus for carrying out evaporative tests.

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§ XIII. Museums.

The Peter Redpath Museum.—The Peter Redpath Museum contains large and valuable collections in Botany, Zoology, Mineralogy and Geology, arranged in such a manner as to facilitate the work in these departments. Students have access to this Museum, in connection with their attendance on the classes in Arts in the subjects above named, and also by tickets which can be obtained on application.

Engineering Museum.— This Museum occupies the third storey of the Engineering Building, and amongst other apparatus, contains the Reuleaux collection of kinematic models, presented by Sir William Macdonald, and pronounced by Professor Reuleaux to be the finest and most complete collection in America.

Architectural Equipment.— The Architectural Department has been endowed by Sir Wm. Macdonald, the founder, with a very thorough equipment for practical purposes of instruction; this is at present in course of provision and completion. In the Museum of the Engineering Building is included a large collection of casts both of architectural detail and ornament (illustrative of the historical development of the various styles) and of architectural and figure sculpture. The freehand-drawing classes for architectural students, as also the classes of architectural drawing and design, are conducted in this portion of the building.

A special architectural department has been added to the University Library; text-books and other works have been added to the Faculty Library. A collection of photographs is placed in the architectural room for the use of students in the class of design, in addition to a select reference library of illustrated works. Diagrams and lantern slides are used in illustration of the historical courses; models and specimens of materials and fittings in those on Building Construction, Sanitation, etc.

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§ XIV. Workshops and Workshop Instruction.

The Workshops, erected on the Thomas Workman Endowment, have a total floor area of more than 25,000 square feet. The course in shopwork is intended to afford some preparation for that study of workshop practice on a commercial scale which every engineer has to carry out for himself. With this end in view, the student works in the various shops of the Department, and completes in each a series of practical exercises. He thus obtains some knowledge of the nature and properties of the various materials he employs; he becomes familiar with the use and care of the more important hand and machine tools; and he acquires some manual skill.

Throughout the course, advanced students are as far as possible entrusted with the construction and erection of machinery and apparatus which afterwards forms part of the equipment of the Department. An air-compressor, a boring bar, a belt-testing machine, and a duplex feed pump, are examples of the work which has been done in this manner. Such students are also encouraged to see and assist in the repairs required by the engines, boilers and machine tools in the Engineering Building.

Equipment.—The Carpenter's Shop and the Pattern Shop contain thirty-eight carpenters' and pattern-makers' benches complete with the necessary sets of hand tools, twenty-two wood-turning lathes with their turning tools, a large pattern-makers' lathe for faceplate work, one circular saw bench, a jig saw, a band saw, two wood trimmers, a surface planer, a thickness planer, a mortising machine, a saw-sharpener, and one universal wood-working machine.

The Smith Shop is provided with sixteen Sturtevant Forges which are power-driven and are connected to an exhaust fan. There is a power hammer, and the necessary equipment of anvils, swage blocks, sets, flatteners, and other tools. Provision is made for instruction in soldering and brazing, and for an elementary course in ornamental wrought iron work in connection with the architectural course.

The Foundry has benches, tools, and apparatus for bench and floor moulding and core-making, and is able to accommodate twenty students. A gas-fired brass melting furnace, a cupola for melting iron, and the necessary core-ovens and core-benches give facilities for undertaking iron foundry work in green and dry sand and for brass moulding. The shop is served by a hand travelling crane of one ton capacity.

The Machine Shop has twelve 18-inch engine lathes, one 18-inch turret lathe fitted for stud and screw making, one 27-inch engine lathe, one brass-finishing lathe, one 36-inch vertical drilling machine with compound table, one universal milling machine with vertical milling attachment and dividing headstock, one planer capable of taking work up to 24″ × 24″ × 5 ft., one 9-inch slotting machine, one 16-inch shaper, one universal grinding machine, a centering machine, a cutter grinder, a tool grinder, and a buffing and emery grinding machine. There are vise benches for eighteen students, with the necessary hand-tools, and a marking-off table. The tool-room contains a full equipment of drills, reamers, milling cutters and accessories, gauges, callipers, and other measuring instruments.

All the machinery in the Workshops is driven electrically by motors taking power from the generating station in the Macdonald Building.

Courses of Instruction.

Instructors in Shopwork.

Carpenter's Shop and Pattern Shop .. .. G. Wooley
Smith Shop .. .. D. Taylor
Foundry.... .. .. H. Lane
Machine Shop .. .. J. F. Macoun

The work of the various shops is carried out under the direction of the Professor of Mechanical Engineering. The following are the subjects of instruction :—

Carpentry and Joiner Work.—Sharpening and care of wood-working tools. Sawing, planing and paring to size. Preparation of flat surfaces, parallel strips, and rectangular blocks. Construction of the principal joints employed in carpentry and joiner work, such as end and middle lap joints, end and middle mortise and tenon joints, mitres, and dado and sash joints. Dovetailing, scarfing. Joints used in roof and girder work. Wood-turning, use of wood-turning tools.

Pattern making.—Use of pattern-makers' tools. Elements of pattern-making, allowances to be made for draught and for contraction in moulding and casting, use of contraction rule. Preparation of prints and plain core-boxes. Exercises in paring and turning. Construction of patterns and core boxes for pipes, flanges, elbows, tees, and valves. More difficult exercises in pattern making, including built-up patterns and face-plate work. Gear and wheel patterns.

Smith-work.—The forge and its tools. Use and care of smiths' tools. Management of fire. Use of anvil and swage-block. Drawing taper, square and parallel work. Bending, upsetting, twisting, punching, and cutting. Welding and scarfing. Forging, hardening, and tempering tools for forge and machine work. Tempering drills, dies, taps, and springs.

Foundry-work.—Moulders' tools and materials used in foundry work. The cupola. The brass furnace. Preparation of moulding sand. Boxes and flasks. Core-making. Use of core-irons. Bench moulding. Blackening, coring and

finishing moulds. Vents, gates and risers. Special methods required in brass moulding. Floor moulding. Open sand work. Advanced examples of moulders' work. Melting and pouring metal. Mixtures for iron and brass casting.

Machine-shop Work.—Exercises in chipping. Preparation of flat surfaces. Filing to straight edge and surface plate. Scraping. Screwing and tapping. Use of scribing block and surface gauge. Marking off work for lathes and other machines. Turning and boring cylindrical work to gauge. Surfacing. Screw-cutting and preparation of screw-cutting tools. Use of turret lathe. Taper turning. Machining flat and curved surfaces on the planing and shaping machines. Plain and circular milling with vertical and horizontal spindles; gear-cutting. Cutter-grinding. Drilling and boring. Use of jigs. Grinding flat and cylindrical surfaces. Cutting tools for hand and machine; their cutting angles and speeds. Dressing and grinding tools.

The following work has recently been completed or is now in progress in the Workshops of Department of Mechanical Engineering :—

72 in. surfacing and boring lathe.

New rocking grate for No. 2 B. & W. boiler.

Two steam separators.

Apparatus for experimenting on efficiency of worm gearing.

Cast-iron testing bed for thermodynamic laboratory.

New fly-wheel and valve gear for 6 in. x 9 in. compressed air engine.

Indicator gear for 9½ in. brake pump.

Compound slide rest for brass finishing lathe.

Set of chasing tools for ditto.

Set of cast iron gauges for machine shop.

Indicator gear for 12 H.P. gas engine.

Brake recording gear for Mackintosh-Seymour ergine; and numerous repairs.

XV. Statement of Research Work in the Laboratories—1901-02.

A new extensometer. Prof. H. T. Bovey. Proc. Roy. Soc. Canada, 1901.

An experimental investigation of the pressure of grain in elevators, and of the pressure of earth against retaining walls. Prof. H. T. Bovey.

The position of the neutral axis in beams of various sections. Prof. H. T. Bovey.

On apparatus for measuring strain and applying stress, with an account of some experiments on the behaviour of iron and steel under stress. Dr. E. G. Coker. Trans. Roy. Soc., Edin., Vol. XI.

On the effect of time and temperature on the strength of iron and steel. Dr. E. G. Coker. Proc. Can. Soc. C.E., 1901.

A determination of the variation with temperature of the resistance of water in pipes. Dr. E. G. Coker and S. B. Clement.

On the effect of cold on the recovery of iron and steel from overstrain. Dr. E. G. Coker.

A new method of measuring the critical velocity of fluids. Dr. H. T. Barnes and Dr. E. G. Coker. Physical Review, July, 1901.

On percolation of water through concrete under varying pressures. Prof. C. H. McLeod.

A special method of determining the effective length of a reversible pendulum. Prof. C. H. McLeod.

On the performance of a non-condensing steam engine with cyclical variation of load. Prof. R. J. Durley.

On the loss from unresisted expansion in the intermediate cylinder of a triple expansion steam engine. Prof. R. J. Durley.

On the co-efficient of discharge for air passing through orifices in thin plates under small differences of pressure. Prof. R. J. Durley.

Dependance of the current through conducting gases on the direction of the electric field. Prof. E. Rutherford. Phil. Mag., 1901.

Emanations from radio-active substances. Prof. E. Rutherford. Phil. Mag., 1901.

Effect of temperature on the emanations from radio-active substances. Prof. E. Rutherford. Phys. Zeit., 1901.

Discharge of electricity from glowing platinum. Prof. E. Rutherford. Trans. Roy. Soc. Canada, 1901.

A new gas from radium. Prof. E. Rutherford and Miss H. Brooks. Trans. Roy. Soc. Canada, 1901.

Discharge of electricity from glowing platinum, and the velocity of ions. Prof. E. Rutherford. Amer. Assoc, for Advancement of Science, 1901. Physical Review.

On the density of ice. Dr. H. T. Barnes. Physical Review, 1901. Phys. Zeit.

An experimental determination, by a thermal method, of the critical velocity of water between 4° and 90°. Dr. H. T. Barnes and Dr. E. G. Coker.

The damping of electrical oscillations. Miss H. Brooks. Phil. Mag., 1901.

Rate of recombination of the ions of gases at different pressures. R. K. McClung. Phil. Mag.

Absorption of Roentgen rays by solutions. R. K. McClung and A. D. McIntosh. Phil. Mag.

Excited radio-activity and ionization of atmospheric air. Prof. E. Rutherford and S. J. Allan. Amer. Phys. Soc. ; Phys. Zeit.

Transmission of excited radio-activity. Prof. E. Rutherford. Amer. Phys. Soc.; Phys. Zeit.

Experiments on excited radio-activity. Prof. E. Rutherford. Phys. Zeit.

Radio-active emanation from thorium compounds. Prof. E. Rutherford and F. Soddy. Journal of Chem. Soc.

Comets' tails, the corona and the aurora borealis. Prof. John Cox. Pop. Science Monthly.

On the crushing and sizing of rocks by means of different types of apparatus. Prof. J. B. Porter and W. G. Flint. Can. Mining Rec., 1901.

On the magnetic concentration of nickel minerals from low grade pyrrhotite ores. (Prof. J. B. Porter.) Dr. A. E. Barlow. Can. Geological Survey.

On the concentration of chromite. Prof. J. B. Porter and Messrs. McBride and Campbell. Can. Mining Institute.

On the rate of flow and the height of waves produced in the flow of thin sheets of water on inclined planes. Prof. J. B. Porter and W. M. Edwards.

On the motion of sized vs. classified mineral grains in water flowing on an inclined plane. W. M. Edwards.

On the treatment of Nova Scotia mispickel concentrates by cyanide, bromocyanide and chlorination methods.

XVI. Donations During Session—1901-02.

Reuleaux models, from Sir William Macdonald.

One slotting machine; one brass finishing lathe; two motors and worm gearing, from Sir William Macdonald.

Bristol Dock Plans, from J. Girdlestone.

Books, from Dr. Bovey and W. B. Dawson, John Blue, Can. Rand Drill Co., Dr. Adams, Dr. Porter, etc.

Specimens, from The John McDougall Caledonian Iron Works.

Drawings, blue prints and reports, from the American Locomotive Company (Schenectady); the Canadian General Electric Company (Peterboro); U. S. Navy Department, Bureau of Construction and Bureau of Steam Engineering; Westinghouse Air Brake Company (Pittsburg); Waterous Engine Company (Brantford); American Bridge Company (per C. Schneider), etc., etc.

Publications:—Inst. C. E. (London); Inst. Mech. Eng. (London); Inst. of Engs. and Shipbuilders, in Scotland; Society of Engineers (London); Liverpool Engineering Society; Amer. Inst. C. E.; Amer. Inst. Mech. Engs.; Can. Soc. C. E.; Cassier's Magazine Company, Am. Inst. Mining Engrs.; The Inst. of Mining and Metallurgy (London); Australasian Inst. Mining Engrs. (Melbourne), etc., etc., etc.

FACULTY OF APPLIED SCIENCE—TIME TABLE—FIRST AND SECOND YEARS.

Years	Hours	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
First Year.	9	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Shopwork *C*)
	10	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Do
	11		English.	Lettering.	English.	Geom. Drawing (*a.*) Lettering (b.)	Do
	12		Physics.	Lettering.	Physics.	Geom. Drawing (*a.*) Lettering (*b.*)	Do
	2 to 5	*A.* Phys. Lab. (*a*) *B.* Shopwork. (S. & F.)	*A.* Physical Lab. *B.* Phys. Lab. (*a*)	Desc. Geometry.	*A.* Shopwork, (S. & F.) *B.* Phys. Lab.	Freehand Drawing.	
Second Year.	9	Mathematics, 1, 2, 3, 4, 5, 6.	Mathematics, 1, 2, 3, 4, 5, 6.	Mathematics, 1, 2 3, 4, 5, 6.	Mathematics, 1, 2, 3, 4, 5, 6.	Freehand Drawing, 1. Surveying, 2, 5.	Archt. Drawing, 1. Shopwork. (S. & F.) 3, 4 (M.) 2, 5.
	10	Experimental Physics, 1, 2, 3, 4, 5, 6.	Chemistry, 6. Surveying, 2, 5.	Mathematics. 1, 2, 3, 4, 5, 6.	Experimental Physics, 1, 2, 3, 4, 5, 6.	Freehand Drawing, 1.	Do
	11	Archt Drawing, 2. Chemical Lab., 3, 4, 5, 6. Freehand Drawing, 1.	Chemistry, 1, 2, 3, 4, 5, 6.	Chemistry 6 Hist. of Archt., 1. Kinematics, 3, 4. Surveying 2, 5.	Chemical Lab., 6. Hist. of Archt., 1. Kinematics, 3, 4.	Mathematics, 1 2, 3, 4, 5 6.	Do
	12	Archt Drawing, 2. Chemical Lab., 3, 4, 5, 6. Freehand Drawing, 1.	Elem. of Archt., 1, 2.	Chemistry, 1, 2, 3, 4, 5, 6	Kinematics, 3, 4.	Chemistry, 1, 2, 3, 4, 5, 6.	Do
	2 to 5	Chem. Lab. 1, 2, 6. Mechl. Drawing. 4. Physical Lab., 3, 5.	Desc. Geometry, 1, 2, 3, 4, 5, 6.	Chemical Lab., 6. Mapping, 2, 5. Shopwork, (S.) 1 ; (M) 3, 4.	Archt. Drawing, 1. Chemical Lab , 6. Mapping, 2. Mechl Drawing. 3, 4, 5.	Chemical Lab , 5. Physical Lab., 1, 2, 3, 4, 5.	

(*A*) One-half of class. (*B*) Other half of class. (*a*) First Term. (*b*) Second Term. (*c*) After Nov. 1st. 1. Architectural Students. 2. Civil Engineering Students. 3. Electrical Engineering Students. 4. Mechanical Engineering Students. 5. Mining Engineering Students. 6. Practical Chemistry Students.
Shopwork :—*S.* Smithy ; *F.* Foundry ; *C.* Carpenter Shop ; *M.* Machine Shop.
The Chemical Laboratories are open to Second, Third and Fourth Year classes daily (Saturday excepted) from 9 a.m. to 5 p.m.

FACULTY OF APPLIED SCIENCE—TIME TABLE—THIRD YEAR.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Architecture, 1. Geology, 2, 5, 6.	Art History, 1. D. C. Machy., 3, 4. Mineralogy, 5, 6. Roads and Canals, 2.	Dyn. of Mach, 3, 4. Freehand Drawing, 1. Geology, 2, 5, 6.	D. C. Machy, 3. 4. Desc. Geom., 2. Designing, 1. Mineralogy, 5, 6.	Hist. of Archt., 1. Mathematics, 2, 3, 4, 5, and 1.** Surveying, 1.*	Geological Excursion, (*c*) 2. 5. Testing Lab. 1, 2, 3, 4, 5.
10	Dyn. of Mach., 3, 4. Freehand Drawing, 1. Transportation, 5.	Chem. Lab. (*a*) 6. Elect. Meas., 3. Org Lab. (*b*) 6. Surveying, 2, 5; 1*. Thermodyn., 4.	Chemistry (*b*) 6. Freehand Drawing, 1. Mechl. Eng. Lab. 4. Shopwork (P. & M.) 3. Surveying, 2, 5.	Designing, 1. Mach. Des., 3, 4, 5.	Geology, 2, 5, 6. Shopwork (F.) (*b*) 4.	Do.
11	Chemistry, (*b*) 5. Freehand Drawing, 1. Indust. Chem. (*a*) 6. Org Chem. (*b*) 6. Metallurgy (*a*) 5, 6. Thermodynamics, 4.	Chem. Lab. (*a*) 6. Org. Lab. (*b*) 6. Theory of Structures, 1, 2, 3, 4, 5.	Mechl. Eng. Lab., 4. Metallurgy, (*a*), 5, 6. Ore Dressing, (*b*), 5. Shopwork (P. & M)., 3. Surveying, 1.	Designing, 1. Machine Design, 3, 4, 5. Org. Chem. (*b*) 6. Roads and Canals, 2.	Chem. Lab. *a*), 6. Freehand Draw. (*b*), 1. Graphical Statics (*a*) 1, 2, 3, 4, 5. Ore-dress. (*b*), 5. Shopwork (*b*), 4. Chem. Lab. } (*b*), 6.** Ore-dress. }	Do.
12	Hist. of Archt., 1. Mathematics, 2, 3, 4, 5 & 1 **	Chem. Lab. (*a*) 6. Org. Lab. (*b*) 6. Theory of Structures, 1, 2, 3, 4, 5.	Chem. Lab Mechl. Eng. Lab., 4. Mining, 5. Municipal Eng., 2 Shopwork, (P. & M), 3.	Indust Chem., 6. Theory of Structures, 1, 2, 3, 4, 5.	Chem Lab., 6. Freehand Drawing (*b*) 1. Graphical Statics (*a*) 1, 2 3, 4, 5. Museum Wk. in Geol. (*b*) 2, 5. Shopwork (*b*), 4.	Museum Work in Geology (*d* & *b*) 2, 5.
2 to 5	Chem. Lab (*a*) 6. Designing, 1. Mapping. 2. Mechl. Drawing, 3, 4. 5. Org. Chem. Lab, (*b*) 6. Struct. Eng., 1	Chem. Lab. (*a*) 6. Designing. 1. Dyn. Lab., 3, 4. Mapping (*a*) 5. Fire Assay Lab.(*b*) 5; 6.** Ore-dress Lab.(*b*) 5; 6.**	Chem Lab., (*a*) 5. 6. Mapping, 1 and 2 Org. Chem. Lab. (*b*) 6. Physical Lab. 3.	Desc. Geom., (*a*) 1, 2. Det. Min., 5, 6. Dyn. Lab., 3. Mechl. Drawing, 4. Modelling (*b*), 1. Railway Struct., (*b*) 2.	Chem. Lab., 6, (*b*) 5. Designing, 1. Graphical Statics, 2. Mapping (*a*) 5. Physical Lab., 3. Shopwork, (P.&M.), 4. Struct. Eng. 1.	

(*a*) First Term. (*b*) Second Term. (*c*) First half of first Term. (*d*) Second half of first Term. (*e*) Second half of Second Term. 1. Architectural Students. 2. Civil Engineering Students. 3. Electrical Engineering Students. 4. Mechanical Engineering Students. 5. Mining Engineering Students. 6. Practical Chemistry Students.

*3rd Year Architects with 2nd Civils. **Optional Course. (Shopwork; *M.* Machine Shop; *P.* Pattern Shop.)

The Chemical Laboratories are open to Second, Third and Fourth Year Classes (Saturday excepted) from 9 a.m. to 5 p.m.

FACULTY OF APPLIED SCIENCE—TIME TABLE—FOURTH YEAR.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Architecture, 1. Electro-Chem. Lab., (*b*) 3. Mining, 5. Th. of Struct., 2 & 1.** Thermodynamics, 4.	Art History, 1. Elect. Eng., 3. Dyn. of Mach., 4. Mining, 5. Phys. Chem., 6. Railway Eng., 2.	Alloys. } (*b*) 5.** Min Prob. } Designing, 2. Dyn. of Mach., (*a*) 4. Geology, (*a*) 1. Iron & Steel, (*a*) 5. Thermodyn., (*b*) 4.	Designing, 1. Hydraulic Machy., etc. 2, 3, 4, 5. Phys. Chemistry. 6.	Mechl. Eng. 4; (*a*) 3, 5, 2. Mining & Metall. Lab., (*b*) 5. Water Colouring, (*b*) 1.	Designing, (*b*) 1. Dynamo Lab., (*b*) 3. Geodetic Lab., 2. Geology (*a*) 1. Min. & Metall. Lab., 5. Shopwork (*M.*) 4.
10	Elect. Chem. Lab. (*b*) 3. Freehand Drawing (*b*) 1. Hydraulics. 2, 3, 4; (*a*) 5. Hydraulics } (*b*) 5 ** Electro Metall. }	Designing, 1. Mechl. Eng. Lab., 4. Ore Deposits, (*b*) 5. Petrography, (*a*) 5. Surveying, 1.** Theory of Str., 2, 1** Thermodyn., 3.*	Designing, 2. Dyn. of Mach., (*a*) 4. Elect. Eng., 3. Freehand Drawing, 1.** Mining, 5. Surveying, 1 ** Thermodyn. (*b*) 4.	Designing, 1 (*b*) 2. Mechl. Eng., 4; (*a*) 2, 3, 5. Mining Mach., (*b*) 5.	Elect. Eng., (*a*) 3. Geodesy, 2. Geology (*a*) 1. Mechl. Eng. Lab., 4. Min. & Metall. Lab., 5. Water Colouring, (*b*) 1.	Do.
11	Electro-Chem. Lab. (*b*) 3. Freehand Drawing, 1. Mining Colloq., 5. Thermodyn., 3.*	Adv. Metall. } (*b*) 5 ** Physiography } Designing, 1. Mechl. Eng. Lab., 4. Ore-dress., (*a*) 5. Org. Chem., 6.	A. C. Machy., 3. Designing, 2. Dyn. of Mach., (*a*) 4. Freehand Drawing, 1.** Mineralogy (*a*) 5, 6. Thermodyn., (*b*) 4. Pract. Geology, (*b*) 5.	A. C. Machy., 3. Designing, 1 Metallurgy, (*b*) 5. Ore-dress. (*a*) 5. Railway Eng., 2. Thermodyn., 4.	A. C. Machy., 3. Designing, 2. Freehand Drawing, 1. Mechl. Eng. Lab., 4. Min. & Metall. Lab., 5.	Do.
12	Chemistry, 6. Freehand Drawing, (*a*) 1. Geodesy, 2. Machine Design, 4; (*a*) 3. Metallurgy, 5. Water Colouring, (*b*) 1.	Designing, 1, 2. Mechl. Eng. Lab, 4. Metallurgy, (*a*) 5. Min Machy., (*b*) 5. Phys. Chemistry, 3.	Geology Colloq., (*b*) 5. Mach. Des, 4; (*a*) 3. Mineralogy, (*a*) 5. 6. Municipal Eng., 2 & 1 **	Adv. Metall. } (*a*) 5 ** Physiog. } Canadian Geology (*b*) 5. Designing, 1, 2. Dyn. of Mach., 4. Org. Chemistry, 6.	Electro Chem., (*b*) 3. Freehand Drawing, 1 Mechl. Eng. Lab., 4. Min. & Metall. Lab., 5. Theory of Struct., 2 & 1 **	Do.
2 to 5	Chemical Lab., 5, 6. Designing, 1, 4; (*b*) 5. Dynamo Lab., 3. Struct. Eng., 1. Test. Lab., 2 & 1.	Chemical Lab., 6; (*a*) 5. Designing, 1, 2, 4 Hydraulic Lab., (*a*) 3. Mechl. Eng. Lab., 4. Petrog. Lab., (*b*) 5. Struct. Eng, 1.	Chem. Lab., 6; (*b*) 5. Designing, 1. (*b*) 5. Dynamo Lab, 3. Hydraulic Lab. (*a*) 2, 4, 5. Shopwork (*S*) 4 (*b*). Testing Lab., (*d*) 4.	Chemical Lab., 5, 6. Designing, 4; (*a*) 1. Mechl. Eng. Lab., 3. Modelling, (*b*) 1. Testing Lab., 2 & 1.**	Chemical Lab, 6. Dynamo Lab., (*a*) 3. Designing, 1, 4. Graph. Statics., 1** Min. & Metall. Lab., 5. Struct., Eng. 1.	

**Optional Course. (*a*) First Term. (*b*) Second Term. (*c*) First half of second Term. (*d*) Second half of first Term. 1. Architectural Students. 2. Civil Engineering Students. 3. Electrical Students. 4. Mechanical Engineering Students. Mining Engineering Students. 6. Practical Chemistry Students.

The Chemical Laboratories are open to Second, Third and Fourth Year Classes daily (Saturday excepted) from 9 a.m. to 5 p.m.

*Fourth year electricals with third year mechanicals.

FACULTY OF APPLIED SCIENCE.

Christmas Examinations, December, 1902.

Day.	First Year.	Second Year.	Third Year.	Fourth Year.
Monday, 15. P.M.			Graph. Stat.	
Tuesday, 16. P.M.		Chemistry.	Geology.	Hydraul. Lab.
Wesnesday, 17. A.M.		Surveying.	Surveying.	Hydraulics.
P.M.	Physics.			Mach. Design Ore Dressing.
Thursday, 18. A.M.		Mathematics.	Mathematics.	Mineralogy.
P.M.	Mathematics.			Elect. Lighting. Pract. Astron.
Friday, 19. A.M.	Geom. Drawing.		Elect. Magnet. Metallurgy.	Metallurgy.
P.M.		Physics.	Mining.	Mech. Engin.

FACULTY OF APPLIED SCIENCE.

April Examinations, 1903.

Date.	First Year.	Second Year.	Third Year.	Fourth Year.
Monday, April 6, A.M.	Desc. Geom.	Desc. Geom.	Th. Struct.	Th. Struct. Elect. Rail. Mechl. Engin.
P.M.			Transport.	
Tuesday, April 7, A.M.	Exp. Physics.	Exp. Physics.	Ore Dressing.	Th. Struct. Designing.
Wednesday, April 8, A.M.			Architecture. Pract. Astron. D. C. Dyn. Mach.	Architecture. Geodesy. A. C. Mach. Thermo. Lab. Mining. Org. Chem.
P.M.		Chemistry.	Org. Chem.	
Thursday, April 9, A.M.	Algebra.		Geology. Dyn. of Mach.	Elect. Chem. Dyn. of Mach. M. & M. Machy.
P.M.		Pract. Chem.	Munic. Eng.	Munic. Eng.
Friday, April 10.	Good Friday.			
Saturday, April 11, A.M.	Dynamics.	Calculus.	Assaying.	
Monday, April 13, A.M.		Kinematics.	Testing Lab. Indus. Chem.	Th. Struct. Adv. Metall. Phys. Chem.
P.M.			Struct. Engin. Elect. Meas. Metall.	Struct. Engin. Metall. (Fe, &c.)
Tuesday, April 14, A.M.	English.	Elem. of Archt. Mechl. Draw'g.	Desc. Geom. Mechl. Drawing.	Hyd. Machy.
P.M.			Anal. Chem.	Gas Anal.
Wednesday, April 15, A.M.		Mechanics.	Mechanics.	Hydraulics. Metall. (Pb, &c.)
Thursday, April 16, A.M.	Trigonometry.	Surveying. Pract. Chem.	Thermodyn.	Thermodyn. Elect. Metall. Petrography.
P.M.				Physiography.
Friday, April 17, A.M.		Hist. Archt. Phys. Lab.	Hist Archt. R. R. Engin. Mach. Design.	Geology. R. R. Engin. Mach. Desgn.
P.M.				Pract. Geol
Saturday, April 18, A.M.			Art Hist.	Art Hist.
P.M.			Mineral.	Min. Anal.

Faculty of Law.

(Macdonald Foundation.)

The Curriculum extends over three years. It includes lectures upon all the branches of the Law administered in the Province of Quebec, and also upon Roman Law, Legal History, and the Constitutional Law of England, and of the Dominion. Its primary design is to afford a comprehensive legal education for Students who intend to practise at the Bar of the Province. In all the courses the attention of Students will be directed to the sources of the Law, and to its historical development. During their first year the students will attend one hundred lectures on Roman Law, from which the Law of this Province is in great part derived. In the lectures on Legal History, the history of our law since the Cession, and its relation with the French and with the English laws, will be explained. First Year Students will also attend courses on the Law of Persons; the Law of Real Estate; the Law of Obligations; the Elementary rules of Procedure; and an introductory course on Criminal Law. The remaining branches of the law, civil, commercial, and criminal, will be dealt with in the second and third years. During the three years the Civil Code, the Criminal Code, and the Code of Civil Procedure will be covered, and lectures will also be given upon subjects, such as Bills of Exchange, Merchant Shipping, and Banking, which are regulated mainly by special statutes. A course of lectures upon Medical Jurisprudence is generally arranged for.

Students have the free use of the Law Library of the Faculty, to which large additions are continually being made, those lately added including the Ontario Reports, Dalloz, Recueil Périodique, and such valuable works of

reference as the American and English Encyclopædia of Law and the American and English Encyclopædia of Pleading and Practice. The principal reports and legal periodicals are taken. A special room for Law Students is provided in the Redpath Library. This room is open during the day, and in the evenings from eight to ten o'clock.

The lectures are delivered in the rooms furnished for the Faculty in the East Wing of McGill College by its munificent benefactor, Sir Wm. C. Macdonald. The Faculty desire to impress upon English students the great importance of obtaining a familiar knowledge of French. In the practice of the profession in this Province it is almost indispensable that a lawyer shall be able to write and speak French. All who intend to become students of law are urged to pay special attention to this subject.

Those students who are able to take the B.A. course before entering upon their legal studies are strongly recommended to do so. Those for whom this is impossible are advised to attend the courses in the Faculty of Arts for two years.

Matriculation.

For particulars of the University Matriculation Examination for students in law see pp. 10-20.

The attention of students who intend to practise law in the Province of Quebec, or to be admitted to the notarial profession, is called to the statutory requirements as to admission to study. These will be found on pp. 259–262 *infra.*

Scholarships and Prizes.

Various scholarships and prizes will be awarded to the students of each year who obtain the highest distinction at the Examinations in April, 1903.

No scholarship or prize will, however, be awarded to any student unless in the estimation of the Faculty a sufficiently high standing be attained to merit it.

Faculty Regulations.

1. Students of Law shall be known as of the First, Second, and Third Year, and shall be so graded by the Faculty. In each year, Students shall take the studies fixed for that year, and those only, unless by special permission of the Faculty.

2. The register of Matriculation shall be closed on the 1st of October in each year, and return thereof shall be immediately made by the Dean to the Registrar of the University. Candidates applying thereafter may be admitted on a special examination to be determined by the Faculty ; and, if admitted, their names shall be returned in a supplementary list to the Registrar.

3. The lectures will be delivered between the hours of half-past 8 and half-past 9 in the morning, and between 4 and half-past 6 in the afternoon; and special lectures in the evening at such hours and in such order as shall be determined by the Faculty. Professors shall have the right to substitute an examination for any such lecture.

4. At the end of each College year there shall be a general examination of all the classes, under the superintendence of the Professors, and of such other examiners as may be appointed by the Corporation. The examination shall be conducted by means of printed questions, answered by the Students in writing in the presence of the Examiners. The result shall be reported as early as possible to the Faculty.

After the examinations, the Faculty shall decide the general standing of the Students.

5. At the end of the third College year there shall be a Final Examination of those Students who have completed the Curriculum. This Examination shall be conducted partly by written papers and partly orally. It shall cover all the subjects upon which lectures have been delivered during the three years' course. Those Students who satisfy the examiners shall be entitled, after making the necessary declaration and payment of the Graduation Fee, to proceed to the Degree of B.C.L. The Elizabeth Torrance Gold Medal shall be

awarded to the Student who shall obtain the highest marks in the Examination, provided his answers shall, in the estimation of the Faculty, be of sufficient merit to entitle him to this distinction. There shall be no Sessional Examination of Students who are candidates in the Final Examination.

6. No Student shall be considered as having kept a Session unless he shall have attended regularly all the courses of Lectures, and shall have passed the Sessional Examinations to the satisfaction of the Faculty in the classes of his year.

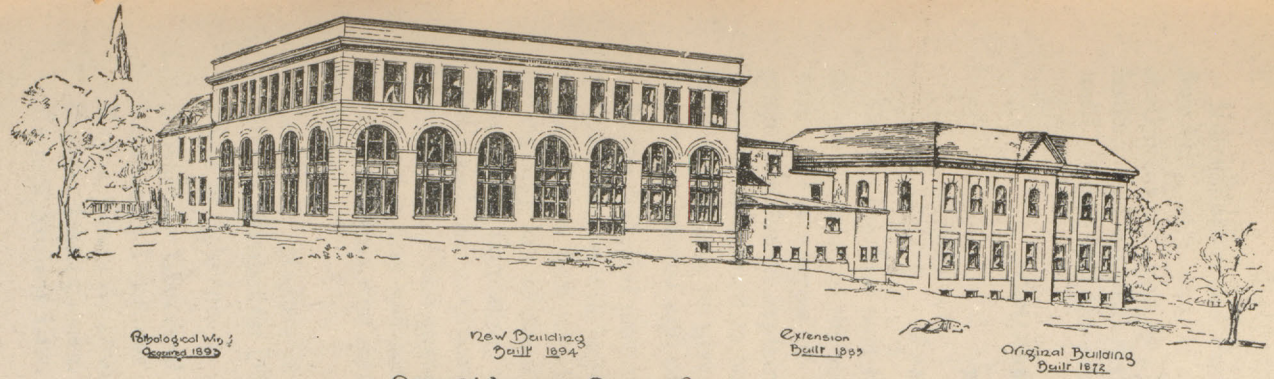
7. The Faculty shall have the power, upon special and sufficient cause shown, to grant a dispensation to any Student from attendance on any particular Course or Courses of Lectures, but no distinction shall in consequence be made between the Examinations of such Students and those of the Students regularly attending Lectures.

8. Every Candidate, before receiving the Degree of B.C.L., shall make and sign the following declaration:—

Ego A.B. polliceor sancteque recipio, me, pro meis viribus, studiosum fore communis hujus Universitatis boni, et operam daturum ut ejus decus et dignitatem promoveam, et officiis omnibus ad Baccalaureatus in Jure Civili gradum pertinentibus fungar.

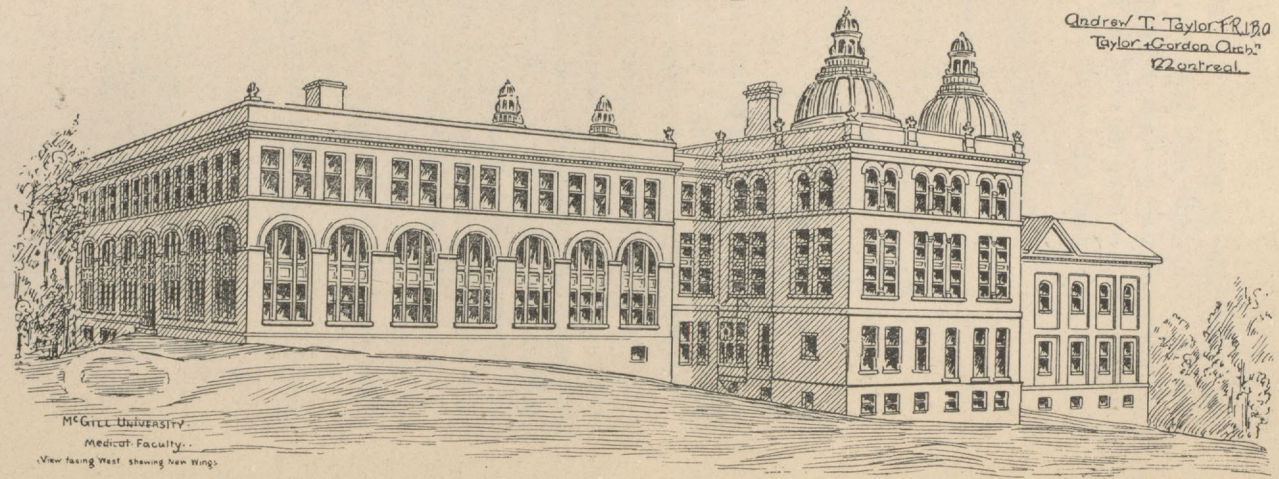
9. The fees in the Faculty will be as follows for Students matriculating after Nov., 1897:—

Matriculation or Registration Fee	$ 5 00
Sessional Fee by Ordinary Students (including Athletics)	53 00
Athletics Fee, payable by Partial Students	3 00
Graduation Fee	12 50
Sessional Fee by Partial Students, for the course of Roman Law, $20; for each of the courses on Successions, Criminal Law, Commercial Law, Obligations and Civil Procedure, $15; and for each one of the shorter courses	10 00



General View from Carlton Road

Andrew T. Taylor F.R.I.B.A.
Taylor & Gordon Archts
Montreal



McGILL UNIVERSITY
Medical Faculty.
View facing West showing New Wings

Matriculation and Sessional Fees must be paid on or before Oct. 1st ; and, if not so paid, the Student in default shall incur a fine of $3 ; his name shall be removed from the books ; and his attendance at lectures shall not be credited until his fees and the said fine have been paid.

COURSES OF LECTURES.

Roman Law.

PROFESSOR WALTON.

During the first part the external history of the law from the early period to the codification of Justinian will be dealt with. The sources of the law will be described, and the gradual evolution explained, by which the law of the city of Rome became fitted to be the law of the civilized world. A brief sketch will be given of the legal institutions of Rome in the first period and of the early constitutional history.

In the doctrinal part of the course matters mainly of antiquarian interest will be touched only slightly. Those portions of the Roman Law which have been followed most closely in the existing law of the Province, *e.g.*, Property, Servitudes, Pignus and Hypothec, and Obligations, will be treated in detail, and the modifications made by the modern law will be noticed. Class-examinations will be held from time to time, and a first and second prize of books will be given to the two students who obtain the highest marks in these examinations.

Text-book, Moyle's or Sandar's Institutes of Justinian, or Girard, Manuel de Droit Romain.

Books of reference :

Muirhead's Historical Introduction to Roman Law.
Muirhead's Institutes of Gaius.
Maynz, Cours de Droit Romain.
Puchta, Institutionen.
Maine's Ancient Law.

Constitutional and Administrative Law.

PROFESSOR WALTON.

The object of this course is to shew the actual working of the Canadian Constitution. A sketch of the Constitutional History prior to Confederation is given. The B. N. A. Act is explained, and the leading cases discussed which illustrate the respective powers of the Federal and of the Provincial Legislatures. The growth of Cabinet Government is traced, and some of the fundamental rules of the English Constitution are expounded and contrasted with those followed in other countries.

No text-book is prescribed, but students are recommended to refer to Todd, Parliamentary Government in the British Colonies ; Houston, Constitutional Documents of Canada ; Dicey, Law of the Constitution; Anson, Law and Custom of the Constitution.

Legal History and Bibliography.

PROFESSOR MCGOUN.

This course comprises an outline of the history of the law in force in the Province of Quebec.

The main source from which this law is derived is the Customary Law of France, as modified by the principles of Roman Law, embodied in several of the codes or collections of Roman Law before the time of Justinian. The Customs of France after being reduced to writing were further modified by the influence of modern Roman Law, which prevailed throughout the larger part of France. The ordinances of the French kings and the commentaries of the great jurists, from Cujas and Dumoulin down to Pothier, brought the Civil Law of France into the systematic form in which it was introduced into this Province. The Custom of Paris, one of the most important of those recognized in France, became formally the basis of the Civil Law in this country, and the ordinance of 1667 was the main authority for procedure.

Since the opening of the British régime the development of Lower Canadian Civil Law has proceeded independently

of the Civil Law of France, where the Code Napoléon was passed early in the Century. In Lower Canada a code on the same lines was adopted shortly before Confederation. Lower Canadian Civil Law has been modified by English law in commercial matters, and also by statutes passed in the Province. The Criminal Law has been derived almost exclusively from the Criminal Law of England.

The leading authorities upon the main branches of the law, with the reports of decisions of our courts, are brought under the attention of the students in this course.

Law of Corporations and of Joint Stock Companies.

PROFESSOR MCGOUN.

This course is the sequel of the course on Agency and Partnership. The doctrine of limited liability and the opportunity which it affords for carrying out enterprises of great importance, by means of capital contributed by a large number of individuals, is treated of in this course. The growth of Corporations, both those established by long custom, and those created by Royal Charter, or by Parliamentary or Legislative authority, is also explained, and the relation between these corporations and the ordinary forms of joint stock companies. Corporations sole and Corporations aggregate are defined, and the principles of laws relating to Corporations and Companies explained. In the alternate years Prof. McGoun will lecture on Agency and Partnership.

Agency and Partnership.

This course begins with the principles of the law of Mandate as laid down in the Civil Code of Lower Canada, and treats of Civil and of Commercial Agency. The rights and liabilities of principal and agent both between themselves and in relation to third parties is considered, and special attention is directed to the powers of agents in selling, pledging, and dealing with the property of the principal. The law relating to Factors or Commission Merchants, Brokers, and other Agents is explained.

In partnership the right of each partner to bind his fellow partner in virtue of the mandate reciprocally given and enjoyed, leads to the distinction between Civil and Commercial partnership, and the Limited Partnership or Société en Commandite is also treated of. The distinction between Partnership and Joint Stock Companies leads to a consideration of the connexion between this subject and the subject of Companies and Corporations which form the subject matter of the Course in the alternate years.

Criminal Law.

PROFESSOR MR. JUSTICE DAVIDSON.

This course includes :—

A history of the Criminal Law and Criminal Procedure of England ; and of their introduction into and development throughout Canada;

Discussion of the Criminal Code and other Statutes enacting criminal offences ; of the rules of evidence in criminal cases; of the Fugitive Offenders' Act ; of extradition ; and generally of the principal features belonging to the Criminal Law of the Dominion.

Commercial Law.

PROFESSOR R. C. SMITH.

The subjects dealt with will include Commercial Sales, Bills and Notes, the law of Carriers, the law of Insurance, and the law of Banks and Banking.

The course on carriers will cover :

1. Carriers, contracts with,
   (a) Affreightment.
   (b) Merchant Shipping.
   (c) Bottomry and Respondentia.

The course on Insurance will cover :

2. Insurance, contracts of,
   (a) Marine Insurance.
   (b) Fire Insurance.
   (c) Life Insurance.

Civil Procedure.

MR. GORDON W. MACDOUGALL.

This course to the students of the First Year is intended to form an introduction to the subject, to explain the simpler kinds of actions, the general rules of pleading, and the jurisdiction of the several courts.

The revised Code of Civil Procedure for the Province of Quebec is the text-book.

Civil Procedure.

MR. PERCY C. RYAN.

The advanced course for the Second and Third Years covers all matters of procedure not dealt with in the First Year Course, and includes Provisional Remedies, such as capias, attachment before judgment, injunction, etc., and special proceedings, such as proceedings relating to corporations and public offices, mandamus, etc., as well as the rules of pleading in the more complicated classes of action. It will be divided into two parts, one of which will be taken in each alternate year.

Marriage Covenants and Minor Contracts, Prescription, Lease, and Municipal Law.

PROFESSOR FORTIN.

Two courses. In alternate years.

Successions, Gifts, and Substitutions.

PROFESSOR MR. JUSTICE DOHERTY.

Two courses. In alternate years.

I. The Law of Succession.

The course consists of a commentary and explanation of the whole of Title I., and the third Chapter of Title II. of the Third Book of the Civil Code. The order followed by the Code in dealing with the different matters, coming within the scope of this course, has however been departed from with a view to presenting to the Student the law governing suc-

cessions as one whole. The subject will be developed as nearly as possible in the following order:—

1. General notions, definitions, and divisions of the subject.

The Testamentary Succession. The Ab-Intestate Succession.

2. Rules of Law common to both Successions.

3. Rules peculiar to the Testamentary Succession.

4. Rules peculiar to the Ab-Intestate Succession.

5. Partition of the Succession (and of property held in undivided ownership generally), its incidents and effects.

II. Gifts and Substitutions.

This course comprises a commentary on and explanation of Chapters I., II., and IV. of Title II. of the Third Book of the Civil Code, dealing with:

1. Gifts inter vivos.

2. Gifts in contemplation of death, as permitted in Contracts of Marriage.

3. Substitutions.

Obligations.

MR. AIMÉ GEOFFRION.

This course of lectures will consist of a commentary on the title on obligations in the Civil Code, less the chapter of proof (articles 982 to 1,202 inclusive). Our law on the subject will be compared with the old French law and the modern French law; and its general principles will be explained and illustrated.

Real Property Law and Registration.

PROFESSOR MARLER.

First Year Course—25 lectures.

Distinction of Things—Corporeal moveables and immoveables; Immoveables by incorporation and destination; Incorporeal property; Real and personal rights.

Ownership—Its characteristics and limitations. Possession, good and bad faith ; Possessory actions ; The Petitory Action; Their results on the Possessor. Accession, natural and industrial.

Usufruct—General characteristics ; Fruits and their perception ; Quasi-usufruct ; Modes of enjoyment by usufructuary; His duties before and during usufruct; How terminated.

Registration—Its modes and formalities ; The Cadastral System.

Second and Third Year Courses.—25 Lectures in alternate Courses.

First Course:—Mode of acquisition of Immoveables—25 Lectures.

In this Course, a Deed of Sale will be analysed and its various clauses explained: The parties; The description and the measurement of land ; The obligations of buyer and seller and the security for their performance. Warranty, its modifications and results ; The form and registration of the deed ; The rights of the wife ; The distinctions between Sale and other modes of acquisition, and their effects on the parties.

Forced sales, their incidents and results.

Examination of Titles, practically considered.

Second Course:—Privileges and Hypothecs ; Servitudes —25 Lectures.

Debts and Causes of Preference.

Characteristics of Hypothec ; The various kinds, their history, conditions and effects; The Ranking of Hypothecs; The Hypothecary action, its characteristics, incidents and results.

Privileges on immoveables.

Registration of Privileges and Hypothecs.

Servitudes.—Natural, legal and conventional ; Water Courses and streams; Walls and fences.

Public International Law.

PROFESSOR LAFLEUR.

Sovereignty and equality of Independent States, Recognition of Belligerency and Independence. Justifiable grounds of intervention. Modes of territorial acquisition. Territorial boundaries. Doctrine of Exterritoriality. Treaties and Ar-

bitrations. Laws of War. Neutrality of States and of individuals. Laws of Blockade. Contraband. Confiscation. Prize-Courts and their jurisprudence.

The students' attention will be specially directed to Treaties, Diplomatic Relations, and International Arbitrations, in which Canada is directly concerned.

Private International Law.

PROFESSOR LAFLEUR.

Distinction between the *a priori* and positive methods. Sources of the positive law of Quebec on the subjects. Application and illustration of the rules for solving conflicts of law in regard to the different titles of the Civil Code. Comparisons between our jurisprudence and that of England, France and Germany.

These two courses will be given in alternate years.

Medical Jurisprudence.

DR. WYATT G. JOHNSTON.

In connection with the course on Criminal Law a short optional course of lectures and demonstrations upon legal medicine is given. The students have an opportunity of studying medico-legal cases in criminal and civil practice. An optional practical course in legal medicine is open to students in both law and medicine.

Special Holidays.

On the following days, when they fall within the session, no lectures will be delivered, viz.: Good Friday, Easter Monday, and Thanksgiving Day. On the following days the morning lectures will be omitted viz.: Ash Wednesday, All Saints Day (Nov. 1st), and Conception (Dec. 8th).

Examinations.

The University Examinations are held in April, at the close of the session.

Requirements for Degree of Doctor of Civil Law.

Adopted October, 1881.

Every Candidate for the degree of D.C.L. in Course must be a Bachelor of Civil Law of twelve years' standing, and must pass such examination for the Degree of D.C.L. as shall be prescribed by the Faculty of Law. He shall also, at least two months before proceeding to the Degree, deliver to the Faculty twenty-five printed copies of a Thesis or Treatise of his own composition on some subject, selected or approved by the Faculty, such Thesis to contain not less than fifty octavo pages of printed matter, and to possess such degree of merit as shall, in the opinion of the Faculty, justify them in recommending him for the degree.

The Examination for the Degree of D.C.L. in Course, shall, until changed, be on the following subjects and authors, with the requirement of special proficiency in some one of the groups below indicated. In the groups other than the one selected by the Candidate for special proficiency, a thorough acquaintance with two works of each group shall be sufficient, including in all cases the work first mentioned in each group and the first two works in the third group. In the first group one work on Public and one on Private International Law must be offered.

1. International Law

A. Public :—

Twiss, Sir T., Law of Nations.
Hall, W. E., International Law.
Harcourt, Sir W. V., Letters by *Historicus*.
Ortolan, T., Diplomatie de la Mer.
De Martens, Droit International.
Holland, Studies in International Law.

B. Private :—

Savigny, Private International Law (Ed. Guthrie).
Bar, Private International Law (Ed. Gillespie).
Foelix, Droit International Privé.

Laurent, Droit Civil International.
Brocher, Droit International Privé.
Fiore, Droit International Privé (Ed. Pradier-Fodéré).
Dicey, Conflict of Laws.
Story, Conflict of Laws.
Lafleur, E., Conflict of Laws.

2. Roman Law.

Maynz, Droit Romain.
Muirhead's Roman Law.
Girard, Manuel de Droit Romain.
Ortolan's Institutes (Ed. Labbé).
Savigny, Roman Law in the Middle Ages.
Cuq, Les Institutions Juridiques.
Puchta, Institutionen.
Krüger, Römische Rechtsquellen.
Roby's Introduction to the Digest.
Hunter's Roman Law.

3. Constitutional History and Law.

Dicey's Law of the Constitution.
Stubbs' Constitutional History of England.
Hearn, Government of England.
Bagehot, English Constitution.
Franqueville, Gouvernement et Parlement Britanniques.
Gneist, Constitution of England.
Hallam, Constitutional History of England.
May, Constitutional History of England.
Gardiner, Constitutional History of England.
Freeman, Growth of the English Constitution.
Mill, Representative Government.
Anson, Law and Custom of the Constitution.

4. Constitution of Canada and Works Relevant Thereto.

Todd, Parliamentary Government in the British Colonies.
Bourinot, Federal Government in Canada.
Cartwright, Cases under the British North America Act.

Lord Durham's Report on British North America.
Lareau, Histoire du Droit Canadien.
Houston's Constitutional Documents of Canada.
Volume O., Statutes of Lower Canada.
Maseres' Collection of Quebec Commissions.
Viollet, Histoire du Droit Français.
Dilke, Problems of Greater Britain.
Bryce, American Commonwealth.
Curtis, History of the Constitution of the United States.
Cooley, Principles of Constitutional Law.

5. Criminal Law, Jurisprudence, and Political Science.

Stephens, History of the Criminal Law.
Blackstone, Vol. IV.
Harris, Principles of Criminal Law.
Holland, Elements of Jurisprudence.
Austin, Lectures, omitting chapters on Utilitarianism.
Lorimer's Institutes.
Amos, Science of Law.
Woolsey, Political Ethics.
Lieber, Political Ethics.
Freeman, Comparative Politics.
Aristotle's Politics, by Jowett.

Appendix.

The attention of intending Students is called to the following provisions of the Revised Statutes of Quebec and amendments, as bearing on the requirements for the study and practice of Law in the Province.

I. Regulations Applicable to those who Intend to Become Members of the Bar.

Article 3544 R.S.Q.—Examinations for admission to study and to practise law in the Province of Quebec are held at the time and place determined by the General Council.

The examinations for the practice are held alternately in Montreal and Quebec every six months, namely—at Montreal, on the second Tuesday of each January, and at Quebec on the first Tuesday of each July.

All information concerning all these examinations can be obtained from the General Secretary's Office. The present General Secretary is Arthur Globensky, Esq., Montreal.

Article 3546.—Candidates must give notice as prescribed by this article at least one month for the study and fifteen days for the practice before the time fixed for the examination to the Secretary of the Section in which he has his domicile or in which he has resided for the past six months.

The present Secretary of the Montreal Section is Robert Taschereau, Esq., N.Y. Life Building, Montreal.

Article 3503a.—Added by Statute of Quebec, 53 Victoria (1890), Cap. 45, provides that Candidates holding the diploma of Bachelor of Arts, Bachelier-es-Lettres, or Bachelier-es-Sciences from a Canadian or other British University are dispensed from the examination for admission to study. Such Candidates are required to give the notice mentioned above.

Article 3548 R.S.Q. (as altered by by-law of the General Council).—On giving the notice prescribed by Article 3546, the Candidate pays the Secretary a fee of $2, and makes a deposit of $45 for a complete certificate of admission to study; of $30 for a partial certificate of admission to study; and of $70 for admission to practice, which deposit, less $10, is returned in case of his not being admitted.

Article 3552 (amended 1894, Q. 57 Vic., c. 35).—To be admitted to practice, the Student must be a British subject, and must have studied regularly and without interruption during ordinary office hours, under indentures before a Notary as Clerk, or Student with a practicing Advocate, during Four Years, *dating from the registration of the certificate of admission to study.* This term is reduced to Three Years in the case of a student who has followed a regular law course in a University or College in this Province and taken a degree in law therein.

The By-Laws passed by the General Council of the Bar of the Province of Quebec, 16th Sept., 1886, and amended 10th Feb., 1892, provide as follows:—

Art. 42.—A course of lectures on law given and followed at a University or College in this Province, and a diploma or degree conferred on students by such university or college, shall be held to be such as contemplated in art. 3552 R.S.Q. only when the university or college conferring the degree and the student who receives it shall have efficiently followed the programme herein set forth. This article and article 44 shall apply to students already admitted only as regards lectures to be given after the 1st of January, 1887.

2. The subjects on which lectures shall be given, and the number of lectures required on each subject for a regular course of lectures on law in a university or college shall be as follows :—

ROMAN LAW :—103 Lectures.

This subject shall include an introduction to the study of Law and the explanation of and comments on the Institutes of Justinian and the principal jurisconsults of Rome.

CIVIL, COMMERCIAL, AND MARITIME LAW :—413 Lectures.

Lectures on these subjects shall cover at least three years. They consist of the history of French and Canadian law, the explanation of and comments on the Civil Code of the Province of Quebec and the Statutes relating to Commerce and Merchant Shipping.

CIVIL PROCEDURE :—103 Lectures.

Lectures on this subject shall extend over at least two years. It shall consist of the explanation of and comments on the Code of Civil Procedure and the Statutes amending it, the organization of the Civil Courts of this Province and the history of the different judicial systems of the country; also, the special modes of procedure provided by statutes and laws of general application.

International Law, Private and Public :—21 Lectures.

Criminal Law :—69 Lectures.

This subject includes the history of criminal law in Canada, the constitution of criminal courts, criminal procedure, comments on statutes relating to criminal law, the relation of criminal law in Canada to the criminal law of England. The lectures shall extend over two years.

Administrative and Constitutional Law :—41 Lectures.

These subjects include an inquiry into the different political institutions and the public institutions of the country, the powers, organization and procedure of the Federal Parliament and of the Local Legislature, the laws on Education and the Municipal Code.

Art. 43.—Candidates for practice who hold a degree in law from a university or college in this Province shall produce, with their notices, a certificate from the principal or rector of such university or college to the effect that they followed a course of lectures on law in the same, during at least three years, in conformity with the by-laws of the Bar ; and such certificate shall further specify the number of public lectures at which they shall have attended on each subject mentioned in the foregoing programme, during each of the said three years. The last part of this certificate shall only be required for courses of lectures given after the 1st January, 1897.

Art. 44.—The examiners shall not consider a university degree in law valid for the purposes of admission to the Bar if they find that the candidate has not in fact followed the programme above.

II. Regulations Applicable to those who Intend to Become Notaries.

For the regulations applicable to candidates for the Notarial Profession see Revised Statutes of Quebec, Arts. 3801-3833, and 53 Vict., c. 45 (Queb.).

TIME TABLE.

INTRODUCTORY LECTURE, Monday, 15th Sept., 4 p.m.

FIRST YEAR STUDENTS, 1902–1903.

Tuesday, 16th Sept., to Friday, 14th Nov., 9 Weeks.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
8.30	Obligations. Mr. A. Geoffrion	Procedure. Mr. Gordon Macdougall.	Obl.	Procedure.	Obl.
4.00	Roman Law. The Dean.	Rom.	Rom.	Rom.	Constitutional Law. The Dean
5.00	Legal History. Prof McGoun.	Persons. Prof. Lafleur.	Hist.	Persons.	Hist.

Monday, 17th Nov., to Friday, 19th Dec., 5 weeks.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
8.30	Obl.	Procedure.	Obl.	Proced.	Obl.
4.00	Rom.	Rom.	Rom.	Rom.	Const.
5.00	Real Rights. Prof. Marler	Persons.	Persons.	Persons.	Real Rights.

CHRISTMAS.

Monday, 5th Jan., to Friday, 6th March, 9 weeks.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
8.30	Obl.		Obl.		Obl.
4.00	Rom.	Constitutional Law. The Dean.	Rom.	Const.	Rom.
5.00	R. R. 3 wks.	Rom.	R. R.	Rom.	R. R.

Monday, 9th March, to Friday, 3rd April, 4 weeks.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
8.30					
4.00	Rom.	Const.	Rom.	Const.	Rom.
5.00	Criminal Law. Prof Mr. Justice Davidson.	Crim.	Crim.		Crim.

Roman Law	115 lectures.	Criminal	10 lectures.
Legal History	25 "	Constitutional and Administrative Law	39 "
Persons	25 "		
Real Rights	25 "	Total	314
Procedure	25 "		
Obligations	50 "		

TIME TABLE.

INTRODUCTORY LECTURE, MONDAY, 15TH SEPT., 4 P.M.

SECOND AND THIRD YEAR STUDENTS, 1902–1903.

TUESDAY, 16TH SEPT., TO FRIDAY, 14TH NOV., 9 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Gifts and Substitutions. Prof. Mr. Justice Doherty.	Civ. Procedure. Mr. Ryan.	Gifts and Substitutions.	C. P.	Gifts and Substitutions.
4.00	Marriage Covenants, &c. Prof. Fortin.	Marriage Covenants, &c.	Roman Law. The Dean.	Marriage Covenants, &c.	Marriage Covenants, &c.
5.00	Criminal Law. Prof. Mr. Justice Davidson.	Commercial Law. Prof. R. C. Smith	Crim.	Comm. Law.	Crim.

MONDAY, 17TH NOV., TO FRIDAY, 19TH DEC., 5 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Gifts, &c.	C. P.	Gifts, &c.	C. P.	Gifts, &c.
4.00	Marriage Covenants, &c. Prof. Fortin.	Marriage Covenants, &c.	Roman.	Marriage Covenants, &c.	Marriage Covenants, &c.
5.00	Criminal.	Commercial Law.	Crim.	Comm. Law.	Crim.

MONDAY, 5TH JAN., TO FRIDAY, 6TH MARCH, 9 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Gifts, &c. 5 wks. C. P. 4 weeks.	Agency, &c. Prof. McGoun.	Gifts, &c. C. P.	Agency, &c.	Gifts, &c. C. P.
4.00	Real Property Law. Prof. Marler. 6 weeks. N.B. This course will begin after the completion of Prof Marler's course to the first year.		R. P. L.		R. P. L.
5.50	Private International Law. Prof. Lafleur.	Commercial Law. Prof. R. C. Smith	P. I. L.	Comm. Law.	P. I. L.

MONDAY, 9TH MARCH, TO FRIDAY, 3RD APRIL, 4 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Agency, &c.	C. P	Agency, &c.	C. P.	Agency, &c.
4.00	R. P. L.		R. P. L.		R. P. L.
5.00	Commercial Law.	P. I. L.	Comm. Law.	P. I. L.	Comm. Law.

Gifts and Wills	50 lectures.	Criminal Law	40 lectures.
Commercial Law	50 "	Procedure	40 "
Agency, &c	25 "	International	25 "
Real Property Law	25 "		
Marriage Covenants	25 "	Total	305
Minor Contracts	25 "		

In addition a short course on Medical Jurisprudence will be given on dates to be afterwards fixed.



Laboratory of Physiology.

Faculty of Medicine.

Foundation and Early History.

The Seventy-first Session of this Faculty will be opened on Tuesday, September 23rd, 1902, by an introductory lecture at 3 p.m. The regular lectures in all subjects will begin on September 24th, at the hours specified in the time-tables, and will be continued until May 23rd, 1903, when the annual examinations will begin.

The Faculty of Medicine of McGill University was founded in 1822 as a medical school under the name of the "Montreal Medical Institution," by Drs. W. Robertson, W. Caldwell, A. F. Holmes, J. Stephenson and H. P. Loedel—all of them at the time members of the staff of the Montreal General Hospital.

Although founded in 1822, yet no session of the "Medical Institution" was held until 1824 when it opened with 25 students; in 1844 the number of students in the Faculty was 50; in 1851, 64, with 15 graduates; in 1872-73, 154, with 35 graduates; in 1892-93, 315, with 46 graduates; in 1895-96, 419, with 90 graduates; in 1900-1901, 465 students were registered.

There were no sessions held during the political troubles from 1836 to 1839, and it is owing to this fact that the present is the 71st session of the Faculty. This is in reality the seventy-fourth session of the school, which is the direct continuation of the "Montreal Medical Institution."

In 1829 the "Medical Institution" was recognized by the Governors of the Royal Institution as the Medical Faculty of McGill University. At this time the lectures were given in a building on the site of the present Bank of Montreal.

Later the school was removed to a brick building, still standing near the corner of Craig and St. George streets.

In 1846 the lectures of the Faculty were given in the present central building of the University now occupied by the Faculty of Arts. On account of the inconvenience arising from the distance of the University buildings from the centre of the city, it was decided in 1850 to erect a Medical school building on Coté Street. This building, provided with ample accommodation for Library and Museum and furnished with a large dissecting room and two lecture rooms was occupied for the first time during the session of 1851-52, and sufficed for the wants of the Faculty until 1872-73, when the front building of the present block was provided by the Governors of the University.

In 1885 this building in the University grounds, erected by the Governors for the use of this Faculty, was found inadequate. A new building was then added, which at the time afforded ample facilities for carrying out the great aim of the Faculty,—that of making the teaching of the primary branches thoroughly practical.

Owing to the larger classes and the necessity for more laboratory teaching, the Lecture Rooms and Laboratories added in 1885 soon became insufficient in size and equipment to meet the requirements of the Faculty. The late Mr. John H. R. Molson with timely generosity came to the aid of the Faculty, and in 1893 purchased property adjoining the college grounds, and enabled the Faculty to erect new buildings and extensively alter and improve those already in use.

These wings were completed and officially opened by His Excellency, the Earl of Aberdeen, visitor of the University, January 8th, 1895. They were erected as an extension of the old ones, towards the northwest, partially facing Carlton road, and convenient to the Royal Victoria Hospital. They connected the Pathological building, a private residence acquired in 1893, with the older buildings, and comprised a large lecture room, capable of accommodating 450 students,

with adjoining preparation-rooms and new suites of laboratories for Pathology, Histology, Pharmacology and Sanitary Science. The laboratories, etc., in the older buildings were also greatly enlarged and improved.

On the ground floor the Library and Museum were enlarged. The original library of the building erected for the Faculty by the Governors in 1872 was furnished as a reading room for the use of students, and the extensive reference library of the Faculty was thus for the first time made available for the use of the students.

On this floor were also the Faculty room, the Registrar's office, the special museum for Obstetrics and Gynaecology, together with Professors' rooms, etc. The chemical laboratories were increased by including the laboratories formerly used by the department of Physiology.

In the basement were the janitor's apartments, cloak rooms with numerous lockers for use of students, the Lavatory, etc., recently furnished with the most modern sanitary fittings.

In less than five years the extension of the practical laboratory work and the increase in the number of students and teachers made an enlargement of the buildings almost imperative. Before, however, the want of space and equipment was very seriously felt Lord Strathcona generously provided means to meet the requirements.

The New Buildings.

The Faculty has great pleasure in announcing that the new Medical Buildings were formally opened by H.R.H. the Prince of Wales, September 19th, 1901, and are now complete and fully equipped. They are the gift of Lord Strathcona, who in the names of Lady Strathcona and the Honorable Mrs. Howard in 1898 contributed $100,000 towards extensions and alterations of the Medical Buildings. These buildings, the result of this munificent donation, will have more than twice the capacity of the buildings occupied during the Session of 1900-1901.

The alterations and extensions may be described as consisting of three wings. First, a Laboratory wing. This is

an exact duplicate of the Molson wing erected in 1893 as part of the alterations and extensions of the building which the Faculty was enabled then to undertake through the generosity of Mr. John H. R. Molson. This wing occupies the north-east corner of the block of buildings and replaces what was formerly the Pathology wing. A second wing connects this with the front building on the east, and the third wing connects the Molson block with the original building on the west side.

The central wings extend east and west about 70 feet and form the central feature of what is now a symmetrical block of cut stone buildings. It will be seen that the stone and brick extensions, erected by the Faculty in 1885 have been entirely removed and replaced by these substantial structures. The alterations and extensions now completed form the larger portion of a scheme of complete reconstruction and extension which will ultimately lead to the replacing of the original stone building now remaining by a facade which will project into the University grounds to the south of the buildings and so convert the whole into a single symmetrical structure.

The new building is of four stories except in the front block, where the three original stories remain. The total length of the buildings, as will be seen by the plan, is 280 feet and the maximum width 145 feet. Its cubic capacity is about 1,750,000 cubic feet, making it the largest of the buildings on the University campus.

The ground floor contains the lavatories, locker rooms, furnace rooms, vat rooms, rooms for stores and janitor's dwelling. And in the laboratory wing there is a large recreation room for students, a student's laboratory for pharmacology and therapeutics, a research laboratory and a private room connected with this department.

The first floor, of which a plan has been inserted, contains, to the right and left of the entrance, occupying the whole floor of the original building, a students' library reading-

room, with accommodation for 200 readers, and the pathological museum. The students' reading-room is connected with a fire-proof stack room which contains the valuable library of the Faculty. This stack room has a capacity of 40,000 volumes, the Library at present containing about 24,000. The Pathological museum on the opposite side of the hall connects with rooms beneath the seats of Lecture Room No. IV. which will be used for special collections and for curators' rooms, and four adjoining rooms for the use of professors as private rooms. On the opposite side of the hallway in the central section of the building are, the professors' common room, the Faculty room and the offices of the Registrar.

The most striking feature in the construction of the building is the large central hall or rotunda extending from the ground floor through the three stories to the roof, lighted by skylight occupying the whole length of the middle section. This hall is 70 feet long by 45 feet wide with galleries at each floor connecting the various laboratories and lecture rooms with broad staircases at each end.

The northern section contains the Chemical Laboratory, 80 feet long by 45 feet wide, and the ceiling 20 feet high, surrounded with draft cupboards, and has benches for 150 to 180 students. Connected with this room is a commodious research laboratory for advanced work in medical chemistry, and a small professor's laboratory. On the opposite side of the hall is a large lecture room with a seating capacity of from 400 to 450, together with students' reading-room for periodicals and newspapers, a small cloak room and preparation rooms connected with the lecture room.

The floor above in the two southern sections is devoted entirely to Anatomy. The dissecting room occupying the top of the front building remains unchanged, and is connected on the west with a series of demonstrators' rooms, a private dissecting room and two rooms for the professor of this department. These rooms surround Lecture Room No. II,

especially arranged for lectures in Anatomy. On the opposite side of the hall, occupying the same area as the lecture room and adjoining rooms is the anatomical museum. Intervening between this and the dissecting room on the east side are, a small demonstration room, locker rooms and service rooms connected with the department of anatomy.

In the northern section are the museum for Hygiene and the Hygiene laboratory. These rooms extend the whole distance across the east and west wings.

On the top floor are the departments of Physiology, Pathology, Bacteriology and Histology. The department of pathology and bacteriology has a laboratory of the same dimensions as the chemical laboratory, 80 x 45 feet, especially well lighted by three large roof lights in addition to the lights on both sides. Besides the tables, lockers, etc., provided for students in this department, there is a small demonstrating theatre and a series of small rooms for advanced work and for special purposes. These include a dark room, an incubator room, reference library and three private laboratories. On the opposite side of the hall occupying a similar floor area are the laboratories for physiology consisting of a students' laboratory which has been especially equipped this year with sets of apparatus for the practical study of the principles of physiology by the graphic method. Connecting the students' laboratory with lecture room No. I., to be used for physiology chiefly, are a series of four rooms for advanced work and special research, service rooms and store rooms.

Occupying the entire northern end of this floor is the Histological laboratory with an adjoining room for private work. This laboratory is 105 feet long and affords space for the use of 150 microscopes at one time.

The laboratory wing is ventilated by a system of artificial ventilation, a powerful fan supplying each laboratory with warm fresh air, while extraction flues, to which extraction fans are attached, draw off the foul air from each room in this wing.

It will thus be seen that the new buildings of the Medical Faculty will contain four lecture rooms, three of which have a seating capacity of 250, the fourth from 400 to 450. There are five museums, namely, for Pathology, Anatomy, Obstetrics and Gynaecology, Pharmacy and Hygiene. Other collections are being made and space has been arranged for their accommodation.

Extensive locker rooms have been arranged so that at a nominal cost each student will have a locker for himself. Lockers will also be provided in connection with each of the large laboratories in which the student would be required to keep his own material, instruments, etc.—as for instance, in connection with the dissecting room and the laboratories for Pathology and Bacteriology. In addition to the large reading room of the Library and the recreation room on the ground floor of the Laboratory wing, a small reading room is provided for the use of students and controlled by the stndents' Medical Society, in which would be kept the daily papers, periodicals, etc.

Matriculation.

For particulars of the University Matriculation, see pp. 10-20.

Intending Students are reminded that a University degree in Medicine does not always give a right to practise the profession of Medicine. It is necessary to conform with the Medical laws of the country or province in which it is proposed to begin practice. Each province in Canada at present has its special requirements for its license and in most provinces a special standard of general Education is insisted upon before beginning the study of Medicine.

The requirements for those who intend to practise in any of the Provinces of Canada, or in Great Britain, etc., are as follows:—

A. General Council of Medical Education and Enregistration of Great Britain.

A license from this body entitles the holder to practice in England, Ireland, Scotland and all colonies except the various provinces in Canada. The Matriculation Examination in Medicine of this

University, as described on pp. 11-22, is accepted by the General Medical Council. Graduates of this University desiring to register in England are exempted from any examination in preliminary education on production of the McGill Matriculation certificate. Certificates of this University for attendance on lectures, practical work and clinics are also accepted by the various examining boards in Great Britain. To obtain a licence from the General Council it is necessary for all Canadian graduates to pass one of the examining boards of Great Britain in both primary and final subjects.

Detailed information may be obtained from one of the three registrars : Henry E. Allen, B.A., 299 Oxford St., London, W. ; J. Robertson, 54 George St., Edinburgh; S. W. Wilson, 35 Dowson St., Dublin.

B. The Province of Quebec.

No University Matriculation Examination is accepted by the College of Physicians and Surgeons of this Province. Graduates in Arts of any British or Canadian University are however exempted from examination on presentation of their Diplomas.

Those who pass the Preliminary Examination described below, or Graduates in Arts who register as students in the C. P. & S., Quebec, *on beginning their studies in Medicine*, obtain on graduating from McGill University a license to practise in Quebec without further examination in any professional subject.

Graduates who have registered with the General Council of Great Britain are at present admitted to practice without examination.

The requirements for the Matriculation Examination of the Province of Quebec for 1902 are :—

LATIN.—Cæsar's Commentaries, Bks. I., II., III.—Virgil's Aeneid, Bks. I. and II.—The Odes of Horace, Bk. I., with a sound knowledge of the Grammar of the Language.

ENGLISH.—For *English-speaking* candidates.—A critical knowledge of of one of Shakspere's plays, viz., A Winter's Tale, for 1902, with English Grammar, as in Dr. Smith or Mason.

For *French-speaking* candidates.—Translation into French of passages from the first eight Books of Washington Irving's Life of Columbus, with questions on Grammar. Translation into English of extracts from Fénélon's Télémaque.

FRENCH.—For *French-speaking* candidates.—A critical knowledge of Racine's "Athalie" and La Fontaine's Fables, Bks. I., II., III., with questions on Grammar and Analysis.

For *English-speaking* candidates.—Translation into English of passages from Fénélon's Télémaque, with questions on Grammar. Translation into French of easy English extracts.

BELLES LETTRES AND RHETORIC.—Principles of the subject as in Haven's Rhetoric, or Boyd's Rhetoric and Literary Criticism. History of the Literature of the age of Pericles in Greece, of Augustus in Rome, and of the 17th, 18th and 19th centuries of England, and France.

HISTORY.—Outlines of the History of Greece and Rome, and particular knowledge of the History of Britain, France and Canada.

GEOGRAPHY.—A general view, with particular knowledge of Britain, France and North America.

ARITHMETIC.—Must include Vulgar and Decimal Fractions, Simple and Compound Proportion, Interest and Percentages, and Square Root.

ALGEBRA.—Must include Fractions and Simultaneous Equations of the First Degree.

GEOMETRY.—Euclid, Bks. I., II., III., IV. and first 20 propositions of Book VI., or the portion of plane Geometry covered by those Books. Also the measurement of the lines, surfaces and volumes of regular geometrical figures.

CHEMISTRY.—Outlines of the subject as in Remsen's Elements of Chemistry.

BOTANY.—Outlines as in Gray's "How plants grow."

PHYSICS.—Outlines as in Peck-Ganot's Physics.

PHILOSOPHY.—Elements of Logic as in Jevon's Logic; Elements of Philosophy, as in Professor Murray's Hand-Book.

The Examinations will be held in September 1902 at Quebec, and in June, 1902, at Montreal. Applications to be made to Dr. J. A. Macdonald, No. 1 Belmont Street, Montreal, or to Dr. J. P. Boulet, Quebec, who will furnish schedule giving text-books and percentage mark s required to pass in each subject.

Examination Fee, twenty dollars. Should the candidate be unsuccessful, one-half of the fee will be returned.

Of the four years' study *after* having passed the Matriculation Examination, three six months' sessions, at least, must be attended at a University, College or Incorporated School of Medicine recognized by the "Provincial Medical Board." The first session must be attended during the year immediately succeeding the Matriculation Examination, and the final session must be in the fourth year.

Students wishing to register degrees in Arts must do so before the 15th of September of the year in which they begin the study of Medicine in order to obtain a license as soon as they graduate from the University.

C. The Province of Ontario.

Every one desirous of being registered as a matriculated medical student in the register of the College of Physicians and Surgeons of this Province, except as hereinafter provided, must present to the Registrar the official certificate of having passed the "Departmental Pass Arts Matriculation Examination," and in addition Physics and Chemistry—whereupon he shall be entitled to be so registered upon the payment of twenty dollars and giving proof of his identity.

Graduates in Arts of any University in His Majesty's dominions, are not required to pass this examination, but may register their names with the Registrar of the College, upon giving satisfactory evidence of their qualifications, and upon paying the fee of twenty dollars.

A certificate from the Registrar of any chartered University conducting a full Arts course in Canada, that the holder thereof matriculated prior to his enrolment in such University, and passed the examination in arts prescribed for students at the end of the first year, shall entitle such student to registration as medical student under *The Ontario Medical Act.*

Every medical student, after matriculating, shall be registered in the manner prescribed by the Council, and this shall be held to be the beginning of his medical studies, which shall date from that registration. To become a Registered Practitioner in this province four years' attendance at a recognized Medical School is required and a fifth year to be spent in hospital or laboratory work must elapse before the final examination is granted.

Students are examined in all the subjects of a medical curriculum by the Examining Board of the C. P. & S. of this province at three examinations, a primary (II. year), an intermediate (1V. year), and a final (V. year).

Full details may be obtained on application to Dr. R. A. Pyne, Registrar, Cor. Bay and Richmond Sts., Toronto.

D. The Province of New Brunswick.

The matriculation requirements of this province are :—

1. ENGLISH GRAMMAR, COMPOSITION, LITERATURE and RHETORIC.
2. ARITHMETIC, including vulgar and decimal fractions, extraction of the square and cube root and mensuration.
3. ALGEBRA, to the end of quadratic equations.
4. GEOMETRY, first three books of Euclid.
5. LATIN, first two books of Virgil's Æneid, or three books of Cæsar's Commentaries, translation and grammar.
6. ELEMENTARY MECHANICS of solids and fluids, comprising the elements of statics, dynamics and hydrostatics.
7. ELEMENTARY CHEMISTRY.
8. CANADIAN AND BRITISH HISTORY, with questions in modern geography.
9. TRANSLATIONS and Grammar of any two of the following languages: *Greek*, *French* and *German*.

In order to pass, a candidate must make an average of sixty per cent., with a minimum of forty per cent. in any one subject.

Dr. Stewart Skinner, of St. John, N.B., is the Registrar of the Council of Physicians and Surgeons of this province, and will furnish details on application.

To become registered as a practitioner in this province it is now necessary to pass examinations in all the Professional Branches.

E. Province of Nova Scotia.

The regulations of the Provincial Medical Board of this province for 1900-1901 are as follows :—

PRELIMINARY EXAMINATION AND REGISTRATION.

1. No person shall begin or enter upon the study of medicine, for the purpose of qualifying himself to practice the same in this province, unless he first produces to the Registrar a certificate from the examiners appointed by the Board to show that he has passed the Preliminary Examination in the subjects prescribed by the Rules and Regulations of the Board, or evidence of having passed such equivalent examination as is accepted by the Board, and unless he causes his name to be forthwith entered in the Medical Students' Register as hereinafter specified (Rule 15).

2. No candidate shall be admitted to the Preliminary Examination unless at least fourteen days previous to such examination he has given notice to the Registrar of the Board of his intention to present himself for such examination, and unless he has produced to the Registrar satisfactory evidence that he has completed his sixteenth year and has paid a fee of ten dollars ($10.00) to the Registrar.*

3. The Preliminary Examination† will embrace the following subjects, viz. :—

(1) ENGLISH. (*a*) *Language*: Grammar, Analysis, Parsing.
(*b*) *Rhetoric and Composition* including an essay on one of several set subjects from prescribed authors.‡
(*c*) *Literature*: History of English Literature ; critical study of prescribed authors.†

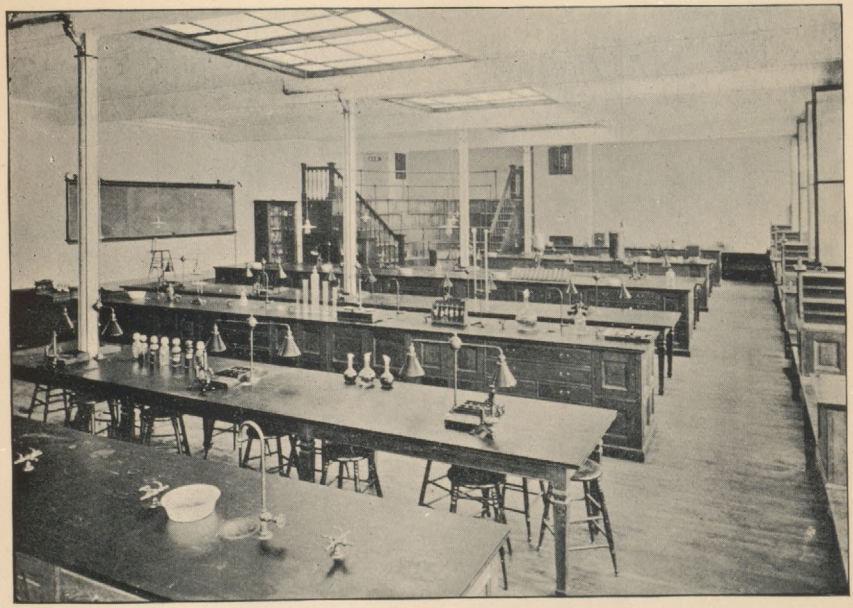
(2) ARITHMETIC. Complete.

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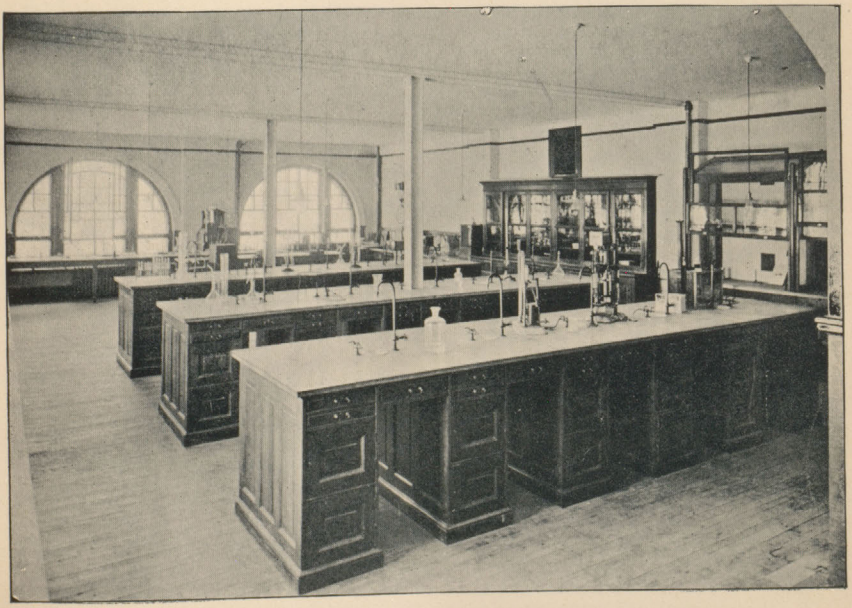
* This fee shall not be returned in case of failure.

† For copies of previous examination papers ($1.00 one entire set) apply to Registrar Provincial Medical Board.

‡ English authors for 1902. DeQuincy, *Joan of Arc* ; Tennyson, *The Princess* Dickens, *Christmas Carol* ; Scott, *Lady of the Lake*.



Laboratory of Pathology and Bacteriology.



In the Laboratory of Hygiene.

(3) ALGEBRA. Simple Rules; Rules for the treatment of Indices; Surds; Extraction of Square and Cube Roots; Equations of the First Degree: Quadratic Equations of one unknown quantity.

(4) GEOMETRY. Euclid, Books I., II., III., with easy deductions.

(5) HISTORY AND GEOGRAPHY. British and Canadian History with questions in General Geography.

(6) LATIN. (*a*) *Translation* from prescribed books, with questions arising out of those books, and translation of easy passages not taken from such books.*
(*b*) *Grammar.*
(*c*) *Composition.*

(7) One of the following:

GREEK. (*a*) *Translation* from prescribed books, with questions arising out of those books, and translation of easy passages, not taken from such books.†
(*b*) *Grammar*, as in Elementary Grammars.
(*c*) *Composition*, as in Frost's Greek Primer.

FRENCH. *Translation* from prescribed books with *Grammar* Questions limited to the Accidence, and based upon the passages prescribed for translation.‡

GERMAN. *Translation* and *Grammar*, as under French.‖

4. Examinations take place twice a year, beginning on the first Thursday in May and the last Thursday in August.

On the same dates local examinations will be held, on application at Sydney, C.B., at Pictou, N.S., and at Yarmouth, N.S. Candidates taking local examinations are required to pay an additional fee of $2.00.

5. Except where otherwise specified, the books prescribed by the Council of Public Instruction for the course leading to the Grade B or High School Junior Leaving Examinations are recommended.

6. In order to pass, a candidate must make fifty per cent. of marks in each subject.

7. If fifty per cent. is made in all subjects but one, and if in that subject the candidate shall have made at least 25 per cent. he may begin study, and attend for one medical year at any medical college recognized by the Board, and thereafter present himself for examination in that subject alone, without payment of any additional fee, except in cases of candidates taking local examinations, who will be required to pay the usual $2.00 fee for such examination.

8. A candidate failing in more than one subject, or failing to make 25 per cent. in any subject, may not begin professional study; he will, however, at any subsequent examination, be exempted from all subjects in which he has already passed and shall for such examination pay an additional fee of $5.00, (or $7.00 if a local examination be taken).

9. Certificates will be issued to successful candidates, showing the subjects in which they have passed, and the extent to which their knowledge of these subjects was tested.

10. Candidates who have passed the above examination will be admitted without further preliminary examination at all Canadian and American Colleges.

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* Latin for 1902. *Cæsar*, De Bello Gallico, Book V, with *Virgil*, Æneid, Book II.

† Greek for 1902. *Xenophon.*, Anabasis, Book III.

‡ French for 1902. *Voltaire*, Charles XII, Books I, II, III.

‖ German for 1902. *Buchheim*, German Reader, Part I.

11. This examination also satisfies the requirements of the General Medical Council of Great Britain as to the preliminary examination which must be passed by persons wishing to register as medical students, provided the candidate shall have passed in all subjects at one examination.

EXEMPTIONS.

12. Graduates in Arts or Science of any recognized College or University, also persons who have passed the entrance examination of the Nova Scotia Barristers' Society, are not required to submit to this examination.

13. The Medical Board will also recognize *pro tanto* the following examinations :

(1) The Matriculation or the Sessional Examinations of any chartered University or College approved by the Board, including McGill University.
(2) The Examinations for Teachers' Licenses, Grade A or B, of Nova Scotia, with 50 per cent. in required subjects.
(3) The Examinations for Junior or Senior High School Leaving Certificates of Nova Scotia, with 50 per cent. in required subjects.
(4) The Examinations for Honour, First or Second Class Ordinary Diplomas, as issued by the Prince of Wales College, P.E.I., with 50 per cent. in required subjects.
(5) The Examinations for First or Second Class Teachers' Licenses of Prince Edward Island, with 50 per cent. in required subjects.
(6) The Examinations for First Class,. or Grammar School Licenses of New Brunswick, with 50 per cent. in required subjects.
(7) The Examinations for corresponding Licenses or Leaving Examination Certificates issued by the Education departments of the other provinces of Canada, with 50 per cent. in required subjects.
(8) The Matriculation or Preliminary Examinations of any Medical Licensing Board or Council authorized by law in His Majesty's Dominions, with 50 per cent. in each subject.

14. After passing his preliminary examination, the medical student may then enter upon his professional course at any University, Medical School or College approved by the Board.

REGISTRATION.

15. *Immediately* after entering upon his course every person engaged in the study of medicine for the purpose of qualifying himself to practice in the Province of Nova Scotia shall forthwith cause to be entered in the register of the Board kept by the Registrar, and called the Medical Students' Register, his name, age, place of residence, date and particulars of his preliminary examination, and place and date of his commencement of the study of Medicine.

16. The fee for such registration is ten dollars ($10.00), except that candidates who already have paid $10.00 for the Matriculation Examination are not required to pay any additional fee.

17. Every student must spend a period of at least four years in actual professional study subsequent to his having passed the Preliminary or Matriculation Examination and being registered as a medical student ; and the prescribed period of study shall include four collegiate sessions of at least eight months duration each year.

18. Candidates for the License of this Board will be required subsequent to their registration as Medical Students, to pass three examinations to be known as the First, Second, and Third Professional Examinations.

19. These examinations will be held annually beginning on the third Wednesday in June of each year. The examinations will be partly in writing, partly oral and practical.

Dr. A. H. W. Lindsay, Halifax, is Registrar of the Provincial Board.

Prince Edward Island.

The requirements of this province are the same as for New Brunswick and has reciprocity with both New Brunswick and Nova Scotia.

The subjects of the examination are as follows :—

1. ENGLISH GRAMMAR, COMPOSITION, LITERATURE and RHETORIC.
2. ARITHMETIC, including vulgar and decimal fractions and extraction of the square and cube root and mensuration.
3. ALGEBRA, to the end of quadratic equations.
4. GEOMETRY, first three books of Euclid.
5. LATIN, first two books of Virgil's Æneid, or three books of Cæsar's Commentary, translation and grammar.
6. ELEMENTARY MECHANICS of solids and fluids, comprising the elements of statics, dynamics and hydrostatics, and elementary chemistry.
7. CANADIAN AND BRITISH HISTORY, with questions in modern geography.
8. TRANSLATION and grammar of any two of the following subjects: *Greek, French, German.*

Fifty per cent. of the marks in every subject shall be required for a pass, and 75 per cent. for honours.

The Registrar of the Medical Council is Dr. Richard Johnson, Prince Street, Charlottetown.

Province of Manitoba.

The matriculation examination of McGill University is accepted by this province. The province holds an examination twice per year. The following are the fixed requirements:—(1) LATIN, (2) MATHEMATICS, (3) ENGLISH, (4) HISTORY, (5) BOTANY, (6) PHYSICS. Subjects 1, 2, 3, 4 the same as required for the Arts Matriculation of Manitoba University, Parts I. and II., and the same standard shall be required to enable the candidate to pass.

Details of this examination can be obtained from the Registrar of the University of Manitoba.

British Columbia.

The College of Physicians and Surgeons of this province does not hold an examination in general education but accepts the examinations recognized by the various boards and universities of the Dominion.

This province examines all candidates for a license in the professional branches, both primary and final. For dates of these examinations see almanack at beginning of the Calendar. Dr. C. J. Fagan, Victoria, B.C., is the Registrar and Secretary of the Council.

North-West Territories.

The College of Physicians and Surgeons of the North-West Territories has no standard of matriculation. It accepts that of any Canadian Medical Board or University.

According to the Amended Medical Ordinances (1900), a licenciate of any province in Canada may register and practice in the North-West Territories on payment of the sepcial fee and without examination. The College reserves the right of examining graduates of all Universities.

J. D. Lafferty, M.D., Calgary, Alberta, is the Registrar. The dates fixed for examinations will be found in the almanack.

Newfoundland.

The Newfoundland Medical Board has a standard of preliminary education equivalent to that required by the General Council of Medical Education of Great Britain.

The examinations for 1901-02 will consist of :—

Compulsory.

ENGLISH LANGUAGE.—Including grammar, composition and literature.
ARITHMETIC.—Including vulgar and decimal fractions, and the extraction of the square root.
ALGEBRA.—To the end of simple equations.
GEOMETRY.—Euclid, books i, ii, iii, with easy questions on the subject matter of the same.
LATIN.—Including grammar, translation from specified authors, and translation of easy passages not taken from such authors.†
ELEMENTARY MECHANICS of Solids and Fluids.‡

Optional.§

HISTORY OF BRITISH AMERICA.—With questions in modern geography.
HISTORY OF ENGLAND.—With questions of modern geography.
FRENCH.—Translation and grammar.
GERMAN.—Translation and grammar.
GREEK.—Translation and grammar.||
MAGNETISM AND ELECTRICITY.
CHEMISTRY.

(*a*) The Board will not, in future, accept any certificate of pass matriculation or preliminary examination in general education, unless the whole of the subjects included in the matriculation or preliminary examination required by the Council for registration of students of medicine have been passed at the same time.

(*b*) Provided that a certificate of having passed a University examination required for graduation in Arts, or a senior or higher local University examination, or an Intermediate grade examination of the Council of Higher Education of Newfoundland, or of the Grade I. license for teachers of Newfoundland, wherein the specified subjects of general education are included, may be recognized for the purpose of registration.

In order to pass a candidate must make fifty per cent. of marks in each subject.

Certificates will be issued to successful candidates showing the subjects in which they passed, and the extent to which their knowledge of these subjects was tested.

Candidates who have passed the above examination will be admitted without further preliminary examination at all Canadian and American colleges.

TEXT BOOKS.—Except when otherwise specified the books prescribed by the Council of Higher Education are recommended.

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† Latin for 1902. *Cæsar* Gallic War, Book I, or *Virgil*, Æneid, Book I.

‡ As in Blackie's Elements of Dynamics, or an equivalent.

§ In communicating with the Registrar, students will please state the optional subject chosen.

|| Greek for 1902, *Xenophon*, Anabasis, Book I; or Hellenica, Book I.

TIME TABLES FOR SESSION 1901-1902.

Time Tables for the Session of 1902-03 will be issued to each student with his Lecture oom ticket on enregistration.

TIME TABLE OF FIRST YEAR.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Anatomy	9	9	9	9	9	.....	Aut. Term No. II. Winter Term No. 1.
Physiology	4	4	.....	4	3	.....	Winter & Spring Terms No. 1.
Chemistry	2	.....	2	2	.....	.....	Autumn Term No. III.
	.....	.....	2	2	.....	.....	Winter & Spring Terms No. III.
Biology	.....	2	.....	.....	2	.....	Autumn Term No. IV.
Bacteriology	3	.....	.....	.....	.....	.....	Spring Term No. I.
Laboratory Work.							
Practical Anatomy	10–1	10–1	10–1	10–1	10–1	9–1	
Prac. Physiology	2–4	.....	3–5	.....	.....	.....	Win. & Sp. Terms.
Prac. Histology	.....	.....	4–6	.....	4–6	9–12	Win. & Sp. Terms.
Prac. Chemistry	10–12	10–12	10–12	10–12	.....	.....	Winter Term.
Prac. Biology	3–6	.....	.....	.....	3–6	.....	Biological Laboratory Art Bld'g. Autumn Term.
Bacteriology	3–5	.....	.....	.....	3–6	.....	Spring Term.

* Class taken in two divisions.

TIME TABLE OF SECOND YEAR.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Anatomy	9	9	9	9	9	.....	Aut. Term No. I. Win. Term. No. II.
Physiology	2	.....	2	.....	2	.....	No. I.
Chemistry	3	.....	3	.....	3	.....	No. III.
Pharmacology and Therapeutics	4	.....	.....	.....	4	.....	No. IV.
Laboratory Work.							
Practical Anatomy	10–1	10–1	10–1	10–1	10–1	10–1	Autumn & Winter Terms.
Prac. Chemistry	9–11	9–11	9–11	9–11	9–11	9–11	Spring Term.
Prac. Physiology	.....	2–5	.....	2–5	.....	.....	Throughout Session.
Prac. Histology	.....	4–6	.....	4–6	.....	9–12	Autumn Term.
Demonstrations and Laboratory Work, Pharmacology	.....	2–4	.....	.....	.....	.....	Throughout Session.

† Half the class only.

NOTE.—Students of the second year when not engaged in the laboratories are required to attend the Out tients' Clinics (only) of M. G. H. or R. V. H. 11 a.m lo 1 p.m. ; attendance to average two hours per week. rtificates required for graduation.

TIME TABLE OF THIRD YEAR.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Obstetrics	9		9				Win. & Sp. Term No. IV
Gynæcology		9		9			Autumn Term, No. IV
Medicine		10	*11-12	10			No. III
Surgery	10		*12-1		10		No. III
Jurisprudence and Mental Diseases	11				11		No. IV.
Pharmacology and Therapeutics		11		11			No. IV
General Pathology and Bacteriology				9	9		Win. & Sp. No. III
	9		9		9		Aut. Term No. III
Hygiene		9	5	9			Winter and Spring
Morbid Anatomy						§9–11	
Clinical Medicine	2 RVH	1 p.m. MGH		2 p.m. RVH	1 MGH		
Clinical Surgery	RVH MGH	2 RVH		MGH	2 p.m. RVH		
Practical Pathology	4–6	4–6		4–6	4–6		Path. Lab. Winter
‡Clinical and Sanitary Chemistry	4–6	4–6		4–6	4 6		Chem. Lab. Autumn
‡Bacteriology	4–6	4–6		4–6	4–6		Path. Lab. Autumn
‡Clinical Microscopy	4–6	4–6		4–6	4–5		Path. Lab. Spring
‡†Operative Surgery	4–6	4–6		4–6	4–6		Dissect. Room, Spring

* Alternate weeks, M.G.H. and R.V.H. † Optional. ‡ Classes taken in groups.
§ Weekly for alternate months R.V.H. and M.G.H.

TIME TABLE OF FOURTH YEAR LECTURES AND CLINICS.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Obstetrics	9		9		9		Aut. Term No. IV
Gynæcology		9		9			Win. & Sp. No. IV
Medicine		10	-12	10			No. III
Surgery	10		‡12–1		10		No. III
Med. and Sur. Pathology		9					No. III
Ophthalmology			5				No. IV
Medical and Surgical Anatomy	5						Autumn Term No. IV
Children's Diseases					5		Win. Term No. IV
*Out Patients' Clinics	11-12 12–1	11–12 12–1	11–12 12-1	11 12 12–1	11–12 12-1	11-12	M. G. H. R. V. H.
Clinical Medicine	1	1		1	1		R. V. H. M. G. H.
Clinical Surgery	2	1		2	1		M. G. H. R. V. H.
Gynæcological Operations		11	4				M. G. H. R. V. H.
*Clinical Ophthalmology	3	4	3		4		M. G. H. R. V. H.
†Gynæcological Clinics		4 3		4 3		11	M. G. H. R. V. H.
Morbid Anatomy						§9-11	Maternity Hospital.
Clinical Obstetrics						1-2.30	
*Dermatological Clinic			2			11	M. G. H.
Genito-Urinary Clinic						3	R. V. H.
*Diseases of Children Clinic	4			4			M. G. H.
*Laryngology	4				4		M. G. H.
		3			3		R. V. H.

* In groups of eight or ten † In groups of four. ‡ Alternate weeks M.G.H. and R.V.H.
§ Weekly for altesnate months M.G.H. and R.V.H.
Special time table published for the Clinics which are attended in groups.

II

COURSES OF LECTURES.

The Corporation of the University, on the recommendation of the Faculty of Medicine, in 1894, consented to the extension of the courses of lectures in medicine over a period of about nine months instead of six.

By this means, (1) The students of the primary years have a more ample opportunity of becoming acquainted, by laboratory work, with those branches of study which form the scientific basis of their profession, and (2) the final students will be able to utilize to better advantage the abundance of clinical material provided in the two Hospitals.

By this arrangement the actual number of didactic lectures per session was decreased, but a corresponding increase was made in the amount of tutorial work and individual teaching in the laboratories for Chemistry, Physiology, Anatomy, Pathology, and Bacteriology, as well as giving more time for clinical work in the Royal Victoria and Montreal General Hospitals, and a greater number of ward classes were also made possible during the session.

The Faculty expects, by thus increasing the time that the different professors, lecturers and demonstrators devote to each student, to accomplish two very important ends: First, to do away with the injurious effects which result from attempting to condense the teaching of medicine and surgery into four or even five sessions of six months; Second, to give each student a sounder and more thoroughly practical knowledge of his profession than could be obtained by attending during even five sessions of six months each.

Anatomy.

PROFESSOR, FRANCIS J. SHEPHERD.
LECTURER, APPLIED ANATOMY, J. A. SPRINGLE.
LECTURER AND SENIOR DEMONSTRATOR, J. G. McCARTHY.

DEMONSTRATORS,
- R. TAIT MACKENZIE.
- J. A. HENDERSON.
- J. J. ROSS.
- A. E. ORR.

ASSISTANT DEMONSTRATORS,
- A. T. BAZIN.
- H. M. CHURCH.
- A. MACKENZIE FORBES.
- R. A. WESTLEY.

Anatomy is taught in the most practical manner possible, and its relation to Medicine and Surgery fully considered. The lectures are illustrated by the fresh subject, moist and dry preparations, sections, models and plates, and drawings on the blackboard.

A course of practical demonstrations in Medical, Surgical and Topographical Anatomy is also given in the final year of the course.

The department of *Practical Anatomy* is under the direct control and personal supervision of the Professor of Anatomy, assisted by his staff of Demonstrators.

The methods of teaching are similar to those of the best European schools, and Students are thoroughly grounded in this branch.

Every student must be examined *at least* three times on each part dissected, and no certificate is given unless the examinations are satisfactory.

Special Demonstrations on the Brain, Thorax, Abdomen, Bones, etc., are frequently given. Prizes are awarded at the end of the Session for the best examination on the fresh subject.

The Dissecting Room is open from 9 a.m. to 6 p.m. In consequence of the excellent Anatomy Act of the Province of Quebec, abundance of material can always be obtained.

Chemistry.

PROFESSOR, GILBERT P. GIRDWOOD.

The course of this subject is carefully graded. Students of the first year receive lectures on Chemical and Physiological Physics and the general principles and theories of the science. In the second year the course on chemistry is extended to embrace its application to physiology and medicine, and includes a course in Organic Chemistry. The lectures are fully illustrated by experiments, for which the department is equipped with all modern Lecture-room apparatus.

Practical Chemistry.

PROFESSOR R. F. RUTTAN,

ASSISTANT DEMONSTRATORS, W. K. BROWN, A. IRVINE,

LABORATORY ASSISTANT, CHARLES STEVENSON.

Laboratory instruction in practical chemistry is given during each of the first three years of study throughout one term.

The first year's course illustrates the general principles of chemical action and the properties of typical elements. During the second year the course will include methods of qualitative analysis and the detection of poisons. In the third year a course of clinical and sanitary chemistry is given, in which the student is made familiar with the application of chemistry to the diagnosis and prevention of disease. Special attention is directed to instructing the student in making accurate notes of his experiments and his conclusions. These notes are examined daily and criticised.

The new chemical laboratories occupy the ground floor of the laboratory wing. The Department of Chemistry has a large students' laboratory, 80 feet by 45, with ceiling 22 feet high, fully supplied with draught cupboards, etc., for classes of 180 students; connected with this is a laboratory for advanced work and post-graduate teaching in medical chemistry; steam, air blast, exhaust pumps, etc., are on each bench. A professors' room and balance room are adjoining.

Physiology.

THE JOSEPH MORLEY DRAKE PROFESSOR, WESLEY MILLS.
LECTURER, W. S. MORROW.
DEMONSTRATORS, J. W. SCANE AND A. A. ROBERTSON.

The purpose of this course is to make Students thoroughly acquainted, as far as time permits, with modern Physiology; its methods, its deductions, and the basis on which the latter rest. Accordingly a full course of lectures is given, in which the physical, the chemical and other aspects of the subject receive attention.

In addition to the use of diagrams, plates, models, etc., every department of the subject is experimentally illustrated. The experiments are mostly free from elaborate *technique*, and many of them are of a kind susceptible of ready imitation by the Student. The laboratory work for students has been greatly increased and during the session of 1902-1903 apparatus to the value of over three thousand dollars will be added to the students' laboratory.

Laboratory work for Senior Students:—

(1.) During a part of the Session there will be a course on Physiological Chemistry, in which the Student will, under direction, investigate food stuffs, digestive action, blood, and the more important secretions and excretions, including urine. All the apparatus and material for this course will be provided.

(2.) The remainder of the Session will be devoted to the performance of experiments which are unsuitable for demonstration to a large class in the lecture room, or that require the use of elaborate methods, apparatus, etc., together with such as each individual of the class can himself conduct.

Laboratory work for Junior Students:—

This will be somewhat similar to the course for senior students, but simpler and anatomico-physiological rather than chemical; like the work for second year students; its main object will be the illustration of important physiological principles.

The new Physiological Laboratory has been fitted up so as to permit of eighty students engaging in work at one time. The fittings and equipment of each bench are of the latest designs and are well adapted to their purpose. The apparatus was especially made by the best American and European makers and thoroughly tested before being accepted.

Each pair of students is supplied with all the apparatus necessary to carry out the work of verifying a large number of the leading principles of physiology and registering the results by the Graphic method.

Provision is also made for a course in Physiological Chemistry covering foodstuffs, digestion, the animal fluids, etc.

The experience of the past session has fully justified expectations in regard to the laboratory and the courses prescribed.

For the purposes of group and class demonstration, other and more complicated apparatus is available, and will be added to as necessity requires.

Additional rooms are provided, seven in number, for a departmental library and professor's office, for preparation apartments, and workshop, and for physiological research.

Histology.

PROFESSOR, GEO. WILKINS.
LECTURER, N. D. GUNN.

ASSISTANT DEMONSTRATORS, HUGH B. FRASER. WALTER B. FISKE. H. B. CUSHING.

The teaching of Histology and Microscopical Methods is spread over two years. During both years practical instruction will be given upon the preparation and mounting of specimens. Students will also be required to make drawings of the specimens prepared by them.

For the first year students, work will commence immediately after the Christmas holidays and continue until the end of the session. The course will consist of laboratory work and demonstrations, with occasional lectures upon elementary and systematic histology up to and including the digestive system. At the end of the session a practical examination will be held on the work done.

During the second year a course of demonstrations and laboratory work together with lectures will be given on more advanced histology and an examination held at Christmas.

Pharmacology and Therapeutics.

PROFESSOR, A. D. BLACKADER.

LECTURER, J. W. HALSEY.

DEMONSTRATOR, R. A. KERRY.

The lectures on this subject are graded in the following manner. For students of the second year, there is (1) a three months' course on Practical Materia Medica and Pharmacy, with demonstrations and exercises in the laboratory. Prescription writing and the various modes of administering drugs are explained and illustrated. (2) A six months' course on the physiological actions of drugs, with practical demonstration of the action of the more important ones. In the third year attention is directed to the Therapeutic Application of all the more important drugs and remedial measures, including Electricity, Hydrotherapy and Climatotherapy.

The new Eddie Morrice Laboratory, comprising a museum of Materia Medica, pharmacological and chemical research rooms, and a large adjoining room for demonstration, has, through the liberality of Mr. Morrice, been fully equipped, and in it during the session 1902-1903 an optional course of practical exercises in pharmacology will be given to advanced students.

Medicine.

PROFESSOR, JAMES STEWART.

ASSISTANT PROFESSORS, { F. G. FINLEY. H. A. LAFLEUR. C. F. MARTIN.

DEMONSTRATOR, S. RIDLEY MACKENZIE.

While the lectures on this subject are mainly devoted to Special Pathology and Therapeutics, no opportunity is lost of illustrating and explaining the general laws of disease. With the exception of certain affections seldom or never observed in this country, all the important internal diseases of the body, except those peculiar to women and children, are discussed, and their Pathological Anatomy illustrated by the large collection of morbid preparations in the University Museum, and by fresh specimens contributed by the Professor of Pathology.

The College possesses an extensive series of plates and models illustrative of the Histological and Anatomical appearances of disease, and the wards of the General and Royal Victoria Hospitals afford the lecturers ample opportunities to refer to living examples of very many of the maladies described, and to demonstrate the results of treatment.

Clinical Medicine.

PROFESSOR, JAMES STEWART.

ASSOCIATE PROFESSORS, F. G. FINLEY AND H. A. LAFLEUR.

ASSISTANT PROFESSOR, C. F. MARTIN.

LECTURERS, { G. GORDON CAMPBELL. W. F. HAMILTON.

The instruction in Clinical Medicine is conducted in the theatres, wards, out-patient rooms and laboratories of the Royal Victoria and Montreal General Hospitals.

The courses include :—

I. The reporting of cases by every member of the Graduating Class, a certain number of cases being assigned to each student.

II. Bedside instruction for members of the Graduating Class.

III. Two Clinics weekly in each hospital.

IV. Tutorial instruction for the Junior Classes, in the wards and out-patient rooms of both hospitals.

V. Instruction in Clinical Chemistry and Bacteriology.

Surgery.

PROFESSOR, THOMAS G. RODDICK.

LECTURERS, J. M. ELDER. A. E. GARROW.

This course consists of the Principles and Practice of Surgery and Surgical Pathology, illustrated by a large collection of preparations from the Museum, as well as by specimens obtained from cases under observation at the Hospitals. The greater part of the course, however, is devoted to the Practice of Surgery, in which attention is constantly drawn to cases which have been observed by the class during the session. The various surgical appliances are exhibited, and their uses and application explained. Surgical Anatomy and Operative Surgery form special departments of this course.

Clinical Surgery.

PROFESSOR, JAMES BELL.

ASSOCIATE PROFESSOR, GEORGE E. ARMSTRONG.

LECTURERS, J. A. HUTCHISON. J. M. ELDER. A. E. GARROW.

DEMONSTRATOR, KENNETH CAMERON.

The teaching in Clinical Surgery is conducted at the Montreal General and Royal Victoria Hospitals.

I. In the amphitheatre of each of these Hospitals, demontrations are given and operations are performed before the senior and junior classes on alternate days.

II. Small ward classes of about ten men in each are taken through the wards by the surgeon in attendance, and instruction given at the bedside concerning the nature and

management of surgical cases, in each hospital, at least once per week.

III. Beds are assigned to students in rotation, and each student is required to carefully study and report cases and to assist in the surgical dressing of the same. Certificates of case reporting are given, and are essential to graduation.

IV. In the Out-patient Department students have an exceptionally good opportunity to study a great variety of injuries, to witness operations in minor surgery, to come into personal contact with patients and to take part in the application of a variety of surgical dressings and appliances.

Obstetrics and Diseases of Infants.

PROFESSOR, J. CHALMERS CAMERON.
LECTURER, D. J. EVANS.
DEMONSTRATOR, JAMES BARCLAY.
ASSISTANT DEMONSTRATOR, H. R. D. GRAY.

This course will embrace : (1) Lectures on the principles and practice of the obstetric art, illustrated by diagrams, fresh and preserved specimens, the artificial pelvis, complete sets of models illustrating deformities of the pelvis, wax preparations, bronze mechanical pelvis, etc. (2) Bedside instruction in the Montreal Maternity, including external palpitation, pelvimetry, the management and after-treatment of cases. (3) A complete course on obstetric operations with the phantom and preserved foetuses. (4) The diseases of infancy. (5) A course of individual clinical instruction at the Montreal Maternity.

Arrangements have been made for a graded course in Obstetrics, instruction being given separately to third year and final students.

Particular attention is given to Clinical instruction, and a Clinical examination in Midwifery similar to that held in Medicine and Surgery now forms part of the final examination.

A short course of lectures on diseases of infancy is given, supplemented by Clinical demonstration and ward work.

Gynæcology.

PROFESSOR, WM. GARDNER.

LECTURERS, F. A. M. LOCKHART AND W. W. CHIPMAN.

DEMONSTRATOR, J. D. CAMERON.

The didactic course is graded, and consists of from forty to forty-five lectures given at intervals alternating with the lectures on Obstetrics and extending throughout the session. The anatomy and physiology of the organs and parts concerned are first discussed. Then the various methods of examination are fully described, the necessary instruments exhibited, and their uses explained.

The diseases peculiar to women are considered as fully as time permits, somewhat in the following order:—Disorders of Menstruation; Leucorrhoea; Diseases of the External Genital Organs; Inflammations, Lacerations and Displacements of the Uterus; Pelvic Cellulitis and Peritonitis and Inflammations of the Ovaries and Fallopian Tubes; Benign and Malignant growths of the Uterus; Tumours of the Ovary; Diseases of the Bladder and Urethra. The lectures are illustrated as fully as possible by drawings and morbid specimens.

Clinical teaching, including out-patient and bed-side instruction, is given at both Royal Victoria and Montreal General hospitals by Professor Gardner and Doctors Lockhart, Chipman and Cameron. A large amount of Clinical material is thus available for practical instruction in this department of medicine. Numerous operations are done before the class, and made the subject of remarks. In addition to the ward-patients, each hospital conducts a large out-patient Gynaecological Clinic, to which advanced students are admitted in rotation and instructed in digital and bi-manual examination and in the use of instruments for diagnosis.

Particular attention is thus given to Clinical instruction, and a Clinical examination in Gynaecology similar to that held in Medicine and Surgery now forms part of the final examination.

Medical Jurisprudence.

PROFESSOR, GEO. WILKINS.

This course is treated of in its Medical as well as Medico-Legal aspects. Special attention is devoted to the subject of blood stains, the chemical, microscopical and spectroscopic tests for which are fully described and shown to the class. The various spectra of blood in its different conditions are shown by the Microspectroscope, so well adapted for showing the reactions with exceedingly minute quantities of suspected material. Recent researches in the diagnosis of human from animal blood are alluded to. In addition to the other subjects usually included in a course of this kind, Toxicology is taken up. The modes of action of poisons, general evidence of poisoning and classification of poisons are first treated of, after which the more common poisons are described, with reference to symptoms, post-mortem appearance and chemical tests. The post-mortem appearances are illustrated by plates, and the tests are shown to the class. A series of demonstrations and Clinics will be given by Prof. Johnston on the Medico-Legal cases arising out of the coroner's court, as well as those in the Montreal General Hospital. In this way Students will have practical clinical instruction in methods of Medico-Legal investigation in civil as well as in criminal cases.

An optional practical course in Legal Medicine, open to students who have fulfilled the necessary requirements in Legal Medicine, will be given by Dr. Johnston. In connection with this is a series of demonstrations and clinics on the medico-legal cases of the Coroner's Court and those arising out of cases in the Montreal General Hospital. A special certificate will be given by the Faculty to those who pas the examination held in connection with this course.

A course open to graduates in Medicine leading to the Diploma of Legal Medicine is given under the Department

of Medical Jurisprudence in co-operation with other departments in the Faculty. (See Post-Graduate Instruction, p. 309.)

Ophthalmology and Otology.

PROFESSOR, F. BULLER.

LECTURERS, J. J. GARDNER. J. W. STIRLING.

DEMONSTRATOR, W. G. M. BYERS.

This will include a course of twenty-five lectures on diseases of the Eye and Ear, both didactic and clinical. In the former, the general principles of diagnosis and treatment will be dealt with, including three lectures on the errors of refraction and faults of accommodation. At the clinical lectures given in the Hospitals, cases illustrative of the typical forms of ordinary disease of the Eye and Ear will be exhibited and explained to the class. In the out-patients' department of each Hospital students have excellent opportunities of gaining clinical experience.

Biology.

D. P. PENHALLOW, PROFESSOR OF BOTANY.

E. W. MACBRIDE, PROFESSOR OF ZOOLOGY.

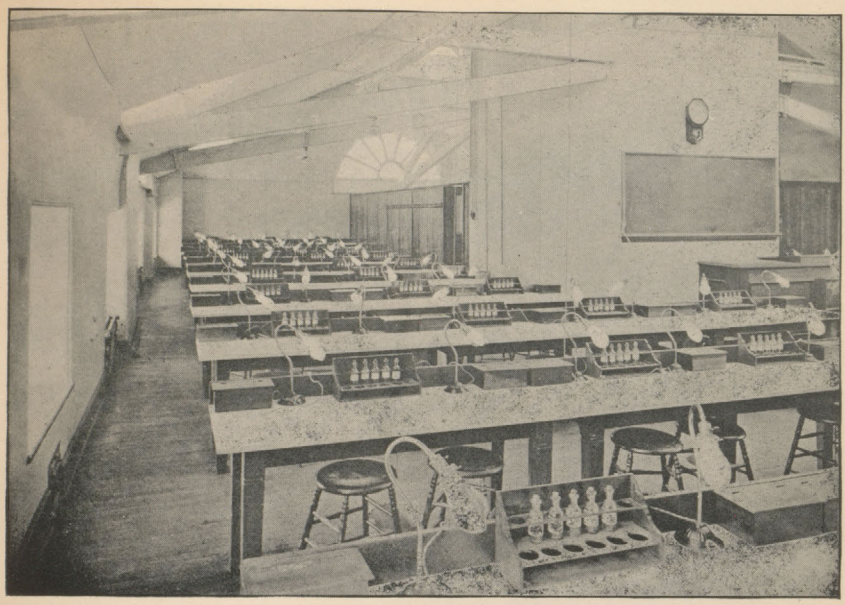
The course in elementary Biology is designed to prepare for special study in medical subjects. Under the supervision of the professors of Botany and Zoology it will be given during the autumn term—Zoology first eight weeks; Botany, last four weeks.

A.—Animal Biology.

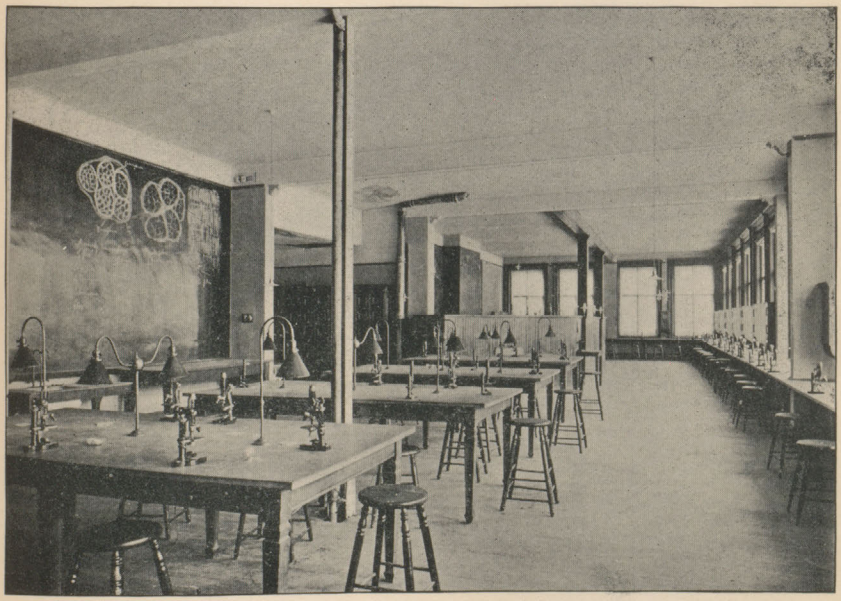
The Course in Animal Biology will discuss the fundamental properties of protoplasm ; the principles of the formation of tissues; the formation of organs; an outline of vertebrate structure and function, as exemplified by Paramoecium and Vorticella, Hydra, Lumbricus and the Dog-fish.

Two lectures and one laboratory period each week.

An optional course in Embryology, especially designed for medical students, is given by the Professor of Zoology, and is open to the students of the Medical Faculty.



In the Zoological Laboratories.



Laboratory of Normal Histology.

B.—Plant Biology.

The Course in Plant Biology will deal chiefly with the general properties of cytoplasm; the structure and nature of the plant cell; movement; nutrition; respiration; fixation of carbon; division of labor and origin of organs; evolution of plant forms. These principles will be illustrated in their more simple forms by a Myxomycete, Pleurococcus, Spirogyra and Oedogonium, Fucus, Saccharomyces and Pteris.

Two lectures and one demonstration each week, beginning on Monday, November 24th, 1902.

Pathology and Bacteriology.

PROFESSOR, J. G. ADAMI.
LECTURER, A. G. NICHOLLS.
FELLOWS, G. A. CHARLTON. P. G. WOOLLEY,
DEMONSTRATORS IN PATHOLOGY, D. P. ANDERSON. J. MCCRAE. D. D. MACTAGGART.
DEMONSTRATOR IN BACTERIOLOGY, H. B. YATES.
DEMONSTRATOR IN NEUROPATHOLOGY, D. A. SHIRRES.
ASSISTANT DEMONSTRATOR IN PATHOLOGY, E. A. ARCHIBALD.
ASSISTANT DEMONSTRATOR IN BACTERIOLOGY, J. A. WILLIAMS.

The teaching, both didactic and practical, in the subjects of Pathology and Bacteriology, are given by the Professor of Pathology and his staff.

For the use of this Department an extensive series of laboratories has been set aside and are now in active use on the top floor of the new wing of the Faculty, and inasmuch as the old Pathological Laboratory was established and equipped by the late J. H. R. Molson, these new laboratories retain the name of the J. H. R. Molson Laboratories.

They consist of a large and admirably lighted class room for general classes capable of accommodating with ease 70 students at a time, so arranged that each student in the bacteriological and pathological courses does the microscopical work at one table and immediately behind him is his locker

and bench for the preparation of material, preparation of culture media, etc. In this room at one end there is also a small demonstration theatre or quarter circle capable of accommodating the whole class at work in the laboratory at one time and used for demonstration purposes, and at the other end a service department from which are given out materials. Further arrangements are installed for lantern demonstrations for the whole class. The large laboratory is so arranged that the students can perform their practical work with the least amount of moving about the room, the students working in pairs and having all the necessary apparatus, reagents, etc., immediately by them.

The following courses constitute the teaching in these subjects :—

1. A course of General Pathology for students of the Third Year; optional for those of the Fourth Year. Lectures are delivered twice weekly throughout the winter and spring terms.

2. A course of Elementary Bacteriology for students of the First Year. Eight lectures with demonstrations being given during the spring term.

3. A course of lectures upon Bacteriology in Relation to Disease, for students of the Third Year, given three times weekly during the autumn term.

4. A course of Demonstrations in the Performance of Autopsies to students of the Third Year. The demonstrations held weekly from October until Christmas.

5. Demonstrations upon the Autopsies of the week to students of the two final years. These are given during the Session by Drs. Adami and Nicholls at the Royal Victoria Hospital, and Drs. MacTaggart, Anderson and McCrae at the Montreal General Hospital.

Practical Courses.

6. The performance of Autopsies. Each student is required to take an active part in at least six autopsies. These are conducted at the General and the Royal Victoria Hospi-

tals and their assistants. In addition to the actual performance of the *sectio cadavoris*, the students are expected to attend practical instruction given with each autopsy, in the method of preparation and microscopical examination of removed tissues so as to become proficient in the methods of preparation, staining and mounting.

7. A practical course in the bacteriology of infectious diseases for students of the third year. This course is held twice weekly during the autumn term. The laboratory fee to cover cost of slides, reagents, microscopes, etc., for this and the following course, is $5.00. A further deposit is required in connection with each practical course to cover cost of breakage and loss, which is returned at the end of the course.

8. A practical course in Morbid Histology to students of the Third Year, this is held twice weekly during the winter term. Students are instructed in the staining and mounting of specimens, and as a rule six sections are distributed at each meeting of the class so that each student obtains a large representative series of morbid tissues, altogether about 120 in number.

9. A course of demonstrations upon Morbid Anatomy, museum specimens, once weekly during the autumn and winter terms to students of the Fourth Year.

In addition to the above, the staff of the department gives instruction to the more advanced students who desire to take any special work in the laboratories, this more especially during the vacations.

For this purpose a special suite of rooms has been set apart for Post-Graduate and Advanced Instruction. Accommodation has been provided for classes of twelve to fifteen. In connection with these Laboratories for Advanced Work there is a Departmental Reference Library, rooms for Photography, etc.

Optional courses are conducted by the Demonstrators of Pathology and the Demonstrator of Neuro-pathology during the Session. Classes in Clinical Pathology and Microscopy

are given at the General and Royal Victoria Hospitals under the direction of the Professors and Lecturers in Clinical Medicine.

In connection with this Department, two Research and Teaching Fellowships have been established, one by the Faculty of Medicine and one by the Governors.

Hygiene.

STRATHCONA PROFESSOR, WYATT JOHNSTON.

Owing to the endowment of the Department of Hygiene by the Right Honorable Lord Strathcona, a teaching Laboratory has been established in connection with the Chair of Hygiene.

The compulsory course in Hygiene consists of three lessons per week during the winter and spring terms. The course includes the hygiene of air, soil, water, and climate; health resorts, personal hygiene, bathing, exercise, clothing, hygiene of special life periods; food and diet; food supply; food diseases and adulterations; hygiene of dwellings; heating, lighting, and ventilation; sanitary fittings; municipal sanitation; water supply; sewage; drainage; refuse disposal; burial of the dead; hygiene of occupation; offensive trades; hygiene of hospitals, prisons, etc.; preventive medicine; methods of dealing with infectious diseases and epidemics; communicable diseases of animals; organisation of health boards; sanitary law and administration in the relation to the medical practitioner; vital statistics in relation to the healthfulness of communities.

The museum, model room, and laboratory are equipped with working models and apparatus illustrative of application of hygienic principles.

An optional practical course will be open to students wishing to undertake more advanced work.

Special courses of instruction are given to graduates wishing to qualify themselves in sanitary work, or to obtain the

diploma in Public Health. "See Post-Graduate Practical Courses."

The Laboratory has been equipped with the apparatus needed in giving practical instruction in Hygiene either as demonstrations to large classes of students, or as practical work for smaller groups.

The arrangement is as follows:—

The Hygiene Department occupies the entire north end of the building on the mezzanine floor, having the floor space corresponding with that of the Department of Histology. The main laboratory is 60 x 50 feet, and it is well equipped with apparatus for demonstrations and practical work in Hygiene. Adjoining it is a Balance Room and private laboratory, 13 x 15 feet. Opening off the main laboratory is the model room, about 45 x 30 feet, part of which can also be used as additional laboratory space for the carrying out of special experiments and researches, which it would be inconvenient to carry on in the main laboratory. The corridor, 40 x 15 feet, leading to the main laboratory, has been fitted up with cases for the smaller museum specimens and models, lantern slides, etc.

Laryngology and Rhinology.

PROFESSOR, H. S. BIRKETT.
DEMONSTRATOR, H. D. HAMILTON.

This course will consist of practical lessons in the use of the Laryngoscope and Rhinoscope. The instruction will be carried on with small classes, so that individual attention may be insured. A limited number of clinical lectures bearing upon interesting cases attending the clinic will be delivered during the session. These lectures will be, however, of an eminently practical nature.

Mental Diseases.

PROFESSOR, T. J. W. BURGESS.

This course will comprise a series of lectures at the University on Insanity in its various forms, from a medical as well as from a medico-legal standpoint. The various types

of mental diseases will be illustrated by cases in the Verdun Asylum, where clinical instruction will be given to groups of senior students at intervals throughout the session.

Diseases of Infants and Children.

PROFESSORS, { A. D. BLACKADER. J. C. CAMERON.

Although this subject does not constitute a special chair in the University, systematic instruction is given (*a*) in connection with the chair of Obstetrics and Diseases of Infants, by Prof. Cameron ; (*b*) by a course of lectures, clinical and didactic by Prof. Blackader, and (*c*) through the Children's Clinic at the Montreal General Hospital and at the Infants' Home.

Clinical Microscopy.

This course, which is given during the Spring Term of the Third Year, is essentially a practical one and is in charge of Professor C. F. Martin, assisted by Drs. W. F. Hamilton, G. G. Campbell, Ridley McKenzie, C. F. Wylde and F. B. Jones. It is a laboratory course forming part of the Third Year instruction in medicine and is held in the Pathological Laboratory of the Medical Building. The classes are held twice weekly, each demonstration lasting two hours.

Students are given instruction in the microscopic appearances of normal and abnormal sediments in the urine, methods of examination of the blood in the fresh and dried state of preparation; minute appearances of the sputum, stomach contents and fæces, as well as of the various animal parasites of the alimentary tract.

In addition to this the student is given an opportunity of examining the various bacteria of importance in clinical medicine and surgery.

Various specimens of special interest which are found in the hospitals from time to time, are examined as occasion arises at the demonstrations.

VI.

DOUBLE COURSES.

B.A. and M.D.

By special arrangements with the Faculty of Arts, it is now possible for students to obtain the double degree of B.A., and M.D., C.M., and also B.Sc. and M.D., after only six years of study.

Course Leading to B.A. and M.D.

It has been decided to allow the the Primary subjects (Anatomy, Physiology and Chemistry) in medicine to count as Honor subjects of the third and fourth years in Arts. It follows then that at the end of four years' study a student may obtain his B.A. degree and have two years of his medical course completed.

The remaining two years of study are devoted to the third and fourth year subjects in Medicine.

The special provisions for Medical Students in the Arts course are as follows :—

During the first two years in the Faculty of Arts students taking the double course will complete their studies in Biology, Physics and Elementary Chemistry.

I.—*In the Third Year*:—*

(*a*) Anatomy and Practical Anatomy, Histology and Physiology, of First Year Medicine.

(*b*) Either one or two of the courses which are not placed under the heading " Science " in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.

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* NOTE.—Students are recommended (1) to distribute their English composition over two years. (2) To take both compulsory courses during the Third year, i.e., with the first year in medicine as the student is free during that year from Chemistry and Biology of the Medical course, whereas during his Fourth year he is required to take the full Second year course in medicine.

II. *In the Fourth Year* :—

(*a*) Anatomy and Practical Anatomy, Histology, Physiology, Chemistry, of Second Year Medicine.

(*b*) One of the courses which are not placed under the heading " Science " if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.

B. Sc. (Arts) and M.D.

The Faculties of Arts and Medicine have this session organized a course of six years' study leading to the double degrees of Bachelor of Science (Arts) and Doctor of Medicine.

The requirements of this course are as follows :—

Matriculation.—The student who proceeds to the Double Course must pass a matriculation examination consisting of English, History, Mathematics (Part 1), French, German and Latin.

First Year.—During the first year the course will include English, French, German, Mathematics and Physics, of the first year of the B.A. Course.

Second Year.—During this year English of the second year B.A. Course, French, German, Chemistry and Elementary Biology. The chemistry consists of three lectures per week and two laboratory periods of three hours. The Biology will consist up to Christmas of the Zoology of the second year in the Faculty of Arts, which is the same as that required of first year students in Medicine with the morphology of the frog in addition. After Christmas (spring term Arts), the student may proceed either to a continued course in Animal Biology comprising the osteology of the rabbit and the histology of its tissues, or he may proceed with the Botany of the second year in the Faculty of Arts. This course in Botany is introductory to the more specialised work of the third year, and will be represented by a number of types, including the flowering plants and the

determination of species. Two lectures and two laboratory periods each week during spring term.

In the event of a student selecting Animal Biology after Christmas, he must have taken before Christmas the course in Biology as laid down for medical students, *i.e.*, both Zoology and Botany. If the student select Botany after Christmas, he must have taken the Zoology of the second year in the B.Sc. Course, *i.e.*, the anatomy of the frog, in addition to that required of medical students.

Third Year.—The student will enter in the third year of his course upon the study of medical subjects proper, having a good theoretical and practical knowledge of Inorganic Chemistry, and will have had a more thorough training in Biology than at present can be given the regular students in medicine. The time, therefore, during this year, which in the regular medical curriculum is devoted to Chemistry, Practical Chemistry and Biology, will be available for Science subjects of the B.Sc. Course; and a student will have the option of four different branches of science, which shall in each case consist of a full regular course, together with one-half an honor course, the Honor Course to be given between September and Christmas.

(I) Zoology, which shall consist of two lectures during the week, and two laboratory periods of about two hours. This course takes up the study of parasitic forms, of comparative osteology and embryology. In addition to this is a half Honor Course, which will consist of a critical study of some such work as Verworn's General Physiology, or Spencer's General Biology.

(II) Physics, which shall consist of two lectures and one period of three hours laboratory work per week. The student may proceed either with Heat and Light, as in the third year Physics Course in Arts, or with Electricity and Magnetism constituting the fourth year Physics in Arts; or he may take a portion of each of these courses, and in addition would do advanced work constituting a half honor course from September to Christmas.

(III) Chemistry, consisting of two lectures per week and two laboratory periods. The time before Christmas to be devoted to Physical Chemistry, and during the second term Organic Chemistry, including organic preparations with advanced work constituting a half honor course from September to Christmas.

(IV) Botany.—This course is designed to give a comprehensive knowledge of plant structure and relationships. The principles of development will be illustrated by type studies, which may also serve as the basis for more special work in Bacteriology, Physiology, Ecology or Paleobotany. It comprises :—(*a*) Microscopy, including determination of amplifications, micrometry, drawings, section cutting and preparation of microscopic objects. This work presupposes familiarity with the optics of the microscope as given in Physics " 3 " of the second year Arts. And (*b*) Critical studies of the Thallophyta, Bryophyta and Pteridophyta, as illustrated by selected types. Two lectures and two laboratory periods each week throughout the session.

Students will also be required to take one-half of the honor work of the fourth year Arts, in experimental plant physiology as based upon the following works :—

Pfeffer, Plant Physiology ; MacDougall, Experimental Plant Physiology; Darwin and Acton, Practical Physiology of Plants. One lecture and four laboratory hours per week during autumn term.

It will be permitted also if a student so desires it, to substitute a half honor course in Chemistry, Physics or Zoology for the half honor course in Botany.

In the fourth year of this six years' course, Wednesday afternoon and Saturday morning of each week will be available for laboratory work in connection with still more specialized study in the subject which has been selected during the third year; or a student may proceed with a branch of science other than the one selected for his third year work, provided he is sufficiently well grounded to enable him to do the special work which may be assigned to him.

Thus the first two years of the six years' course are devoted entirely to the Faculty of Arts, the student taking the option of Biology instead of Mathematics for the second year.

The third and fourth years will consist of work partially given in the Faculty of Arts and partially in the Faculty of Medicine. In the third year the studies in the two Faculties will be nearly equal; in the fourth year they will be almost entirely in the Medical Faculty.

The fifth and sixth years will be occupied by the regular curriculum of the third and fourth years in medicine.

To secure privileges connected with either of the double courses described above, certificates of registration in the Medical Faculty must be presented at the beginning of each year to the Dean of the Faculty of Arts; and at the end of each session in the first two years certificates of attendance on lectures and of passing the corresponding examinations must also be presented. At the end of the Third and Fourth Years certificates must be presented to show that the full curriculum of the Medical Faculty for the year has been completed.

A certificate of Licentiate in Arts will be given along with the professional degree in Medicine to those who, previous to entrance upon their professional studies proper, have completed two years in the Faculty of Arts, and have duly passed the prescribed examinations therein.

The Faculty of Medicine strongly recommends students to take an Arts course before beginning Medicine whenever possible, devoting special attention to Chemistry, Biology, Physics, and German. Should a student have but one year at his disposal he is advised to take Chemistry, Biology and Physics of the Faculty of Arts as a preliminary training for Medicine.

V.

GRADUATE AND ADVANCED COURSES.

The Faculty of Medicine in 1896 established post-graduate and special courses in connection with the Montreal General and Royal Victoria Hospitals and the various laboratories in

the University buildings. These courses will be continued in 1902-1903.

There will be two distinct sets of courses, one a short practical and clinical course for medical men in general practice who desire to keep in touch with recent advances in Medicine, Surgery and Pathology, and who wish special clinical experience in Gynaecology, Ophthalmology, Laryngology, etc. This course will last about six weeks, beginning about the first of May.

A special detailed programme will be prepared, and will be sent on application in February next. The fee, including hospital fees for both hospitals, is fifty dollars.

The other courses will be for those who have just completed their regular course in Medicine, and desire special Laboratory or Clinical teaching before beginning practice.

Arrangements have also been made to accommodate a limited number of such graduates who desire advanced and research work.

Commodious laboratories for advanced work have been equipped in connection with the Pathological and Clinical departments of both the Royal Victoria and Montreal General Hospitals, and in connection with the general laboratories for Pathology, Pharmacology, Physiology and Chemistry, recently altered and extended in the new buildings of the Faculty.

Recent graduates of recognized universities desiring to qualify for examinations by advanced laboratory courses, or who wish to engage in special research, may enter at any time by giving notice, stating the courses desired and the time at their disposal.

All the regular clinics and demonstrations of both hospitals will be open to such students on the same conditions as undergraduates in medicine of this University.

These laboratories have been open for graduates since May 1st, 1896.

Further details regarding courses, fees, etc., may be obtained on application to the Registrar.

The Graduate Course of 1902.

The seventh regular course of instruction for General Practitioners will be conducted as before by the Faculty of Medicine of McGill University. The course for 1902 begins Monday, April 28th, and will be continued for six weeks, closing June 7th.

Time Tables are issued for each week, giving the place and hour for the clinic, demonstration or laboratory work.

Physicians desiring opportunities to familiarize themselves thoroughly with the technique of one or two subjects, instead of attending all the clinics, etc., will be assigned to special clinics or laboratories where additional instruction will be afforded them.

The work of the Regular Course is essentially practical, and may be classified into :—

(*a*) Laboratory Courses.
(*b*) Laboratory and other special demonstrations.
(*c*) Theatre and Ward Clinics, Medical and Surgical.
(*d*) Clinics in special departments of Medicine and Surgery.

(A.)—Laboratory Courses.—Systematic laboratory instruction is given from 9 to 10.35 every morning on Microscopical Methods, Clinical Microscopy, Clinical Chemistry and Clinical Bacteriology, including diagnosis of Diphtheria, Tuberculosis, etc., the histology of blood in disease and serum diagnosis. These courses are conducted by Profs. Ruttan, Adami and Martin, assisted by Drs. N. D. Gunn, Nichols, Anderson, Yates, Williams, Fraser and Fisk. A course of Operative Surgery on the cadaver is given by Prof. Armstrong from 8 to 9 a.m., during the second, third and fourth weeks of the course.

(B.)—Laboratory and Special Demonstrations.—These demonstrations are given daily from 10.30 to mid-day, and will consist of one or more of the following :—Modern treatment of Tuberculosis, Prof. Finley; Operative Midwifery,

Prof. J. C. Cameron; Mental Diseases, Dr. Burgess; Medico-Legal and Sanitary Topics, Prof. Wyatt Johnston; Clinical use of Roentgen Rays, Prof. Girdwood; Demonstration of the actions of certain important and new drugs, Dr. J. T. Halsey; Medical and Surgical Anatomy, Drs. Springle, Henderson and Tait McKenzie; Clinical Chemistry and Urinalysis, Prof. Ruttan; Morbid Anatomy of certain diseases, Prof. Adami and Dr. MacTaggart; Treatment of Diarrhœal diseases of Infancy, Prof. Blackader; Treatment of deformities, Dr. Tait McKenzie; Medical Examination for Life Insurance, Prof. Wilkins.

(C).—Medical and Surgical Clinics.—For four days each week during the first two hours of the afternoon, there are clinics on groups of cases in the wards of the Montreal General and Royal Victoria Hospitals. Those given in the Medical Wards of the Montreal General Hospitals are given by Profs. Blackader, Finley and Lafleur; in the Surgical Wards by Prof. Shepherd and Dr. Elder; in the Royal Victoria Hospital Medical Wards, by Prof. Stewart, Prof. C. F. Martin and Dr. Hamilton; in the Surgical Wards by Prof. Bell and Dr. Garrow. In addition two or three ward classes are given weekly.

(D.)—Clinics in Special Departments of Medicine and Surgery.—One or more of these clinics are given in the Hospitals each afternoon after the regular Medical and Surgical Clinic, and during the entire afternoon on Wednesday and Saturday of each week, the following special Clinics are given: Opthalmology, including demonstrations of the use of Opthalmoscope in the Royal Victoria Hospital by Prof. Buller and Dr. Byers; in the Montreal General Hospital by Dr. J. J. Gardner and Dr. Sterling; Dermatology, Prof. Shepherd; Genito-Urinary Surgery, Prof. Bell; Orthopedics, Dr. C. W. Wilson; Laryngology, Prof. Birkett and Dr. H. D. Hamilton. Special Demonstration on Diseases of the accessory nasal cavities by Dr. Hamilton; Gynæcology, Prof. Wm. Gardner and Dr. Chipman in the Royal Victoria Hospital,

and Dr. Lockhart and Dr. J. D. Cameron in the Montreal General Hospital; Diseases of Children, Prof. Blackader and Dr. Evans. The use of the Cystoscope and Urethroscope, Dr. Springle.

The above courses of instruction are given wholly apart from the regular lectures, clinics, etc., for undergraduates in medicine. Physicians may enter on the course at any time after April 28th.

The fee for the course including Hospital fees is $50.00. Special fees arranged for single courses.

Practitioners who purpose attending this course may obtain time tables, etc., of courses, on application to the Registrar.

Diploma Course in Public Health.

The Faculty of Medicine in the session 1899-1900 instituted a graduate course in Public Health and Sanitary Science. This course will be given each year and the diplomas conferred at the annual convocation.

Candidates undertaking this Course must have possessed a degree in Medicine or other qualification of practice for at least twelve months before the candidate is competent to receive the diploma. The following are the courses requisite :—

1. Course of lectures in Public Health (to be omitted in the case of candidates who have attended such a course before graduation).

2. A three months' course of instruction upon infective and parasitic diseases of man and the domestic animals, which course shall include practical work in a bacteriological laboratory.

3. A six months' course of practical study of outdoor sanitary work under a medical officer of health (to be omitted in the case of medical health officers holding appointments prior to the establishment of this diploma course).

4. Three months' attendance and clinical instruction at a hospital for infectious diseases (unless such course has already been taken prior to graduation).

3. Three months' instruction in sanitary chemistry and physics with practical work in a chemical laboratory.

Examination for Diploma shall cover the following subjects :—

1. Examination of clinical cases at an infectious hospital.

2. The drawing up of outlines for annual and other reports of officers of health.

3. Report upon the sanitary condition of some actual locality.

4. The chemical analysis of liquids and gases and of specimens of food.

5. Demonstration of the consideration and use of meteorological hygienic and sanitary apparatus.

6. Microscopical examination of specimens submitted.

7. Description of specimens of human and other diseased tissues.

8. Practical examination in the employment of the usual bacteriological methods.

9. The inspection of carcases of animals to be used for food.

The above examination shall be written and oral and practical, and shall extend over a period of four days.

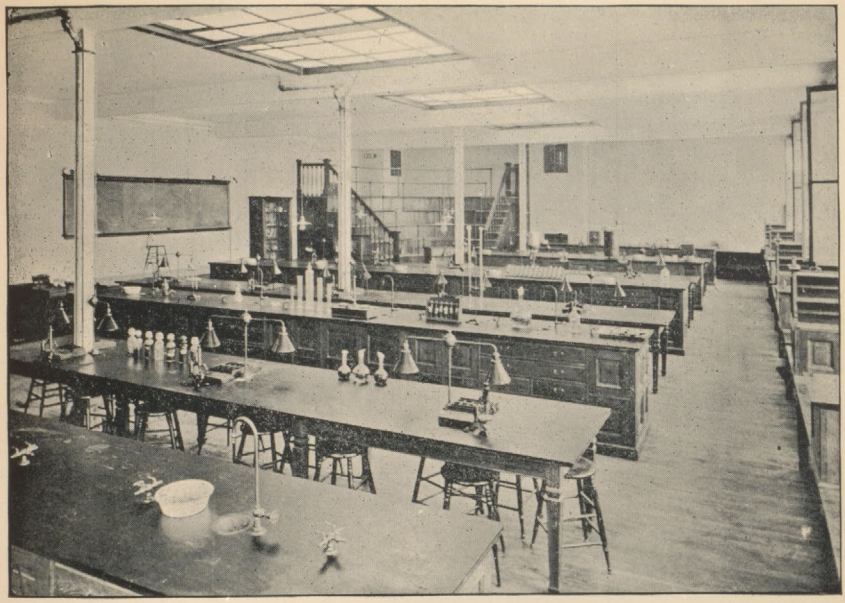
The following is a list of subjects included in the curriculum of study :—

(*a*) *Sanitary Chemistry*, examination of air, gases, water, the action of water on metals, milk and food; detection of poisons in articles of dress and of decoration; the chemistry of sewage.

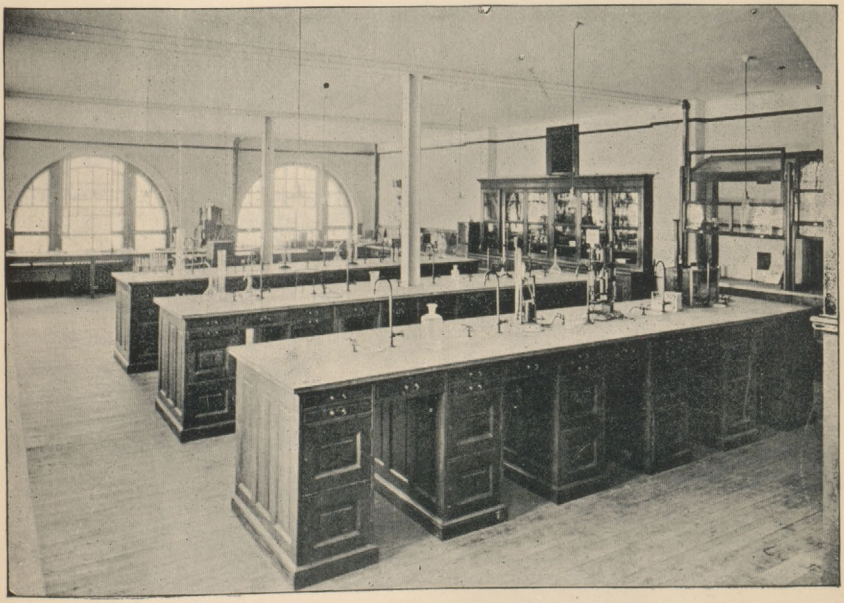
(*b*) *Sanitary Physics* : Hydrodynamics, pneumatics and hydraulics applied to hygiene, light and photometry ; heat and thermometry; the principles of hygrometry.

(*c*) *Sanitary Legislation* : Statutes and by-laws relating to public health; the powers of public sanitary authorities.

(*d*) *Bacteriology and Parasitology* : Modes of propagation of disease and transmission of disease between man and man, and man and animals; bacteriological analysis in relation to public health matters ; natural history of microbes and animal parasites.



Laboratory of Pathology and Bacteriology.



In the Laboratory of Hygiene.

(*e*) *Vital Statistics*: Calculation and tabulation of returns of births, marriages, and deaths and diseases.

(*f*) *Nosology* : Definition in nomenclature and classification of disease.

(*g*) *Meteorology and Climatology* : The geographical and topographical distribution of disease.

(*h*) *Preventive Medicine and Practical Sanitation.*

The fee for the Diploma shall be $20.

Diploma of Legal Medicine.

The Faculty of Medicine decided in 1900 to grant a Diploma in Legal Medicine, and to give Post-Graduate instruction leading to this diploma. The course will be continued during the session of 1902-1903.

Candidates for the diploma must possess a degree in Medicine or other qualification for practice, and present certificates of having attended the following courses :—

1. A course of six months' scientific study in Legal Medicine, consisting of systematic lectures and practical medico-legal and toxicological instruction in laboratories and elsewhere.

2. A course of six months' training as assistant in medico-legal practice. The candidate shall produce a certificate, or certificates satisfactory to the Faculty, that he has continuously and actively assisted in the regular duties of some medico-legal expert, recognized by the Faculty. Of the two six months' courses referred to in this and the preceding paragraph, not less than three months shall be concurrent.

3. A special course or courses, of lectures in Legal Medicine and mental diseases.

4. A practical (laboratory) course in Toxicology.

5. A course of instruction in the law relating to medicine, and to the status, rights, and responsibilities of the physician.

6. A series of short courses with demonstrations upon the following subjects: (*a*) Methods of conducting medico-legal autopsies. (*b*) The methods of medico-legal microscopy ;

procedure in the examination of blood-stains, etc. (*c*) Methods in skingraphy. (*d*) Methods of procedure in cases of wounds and injuries. (*e*) Method of procedure in cases of assaults upon women and children. (*f*) Methods of procedure in cases of abortion and infanticide. (*g*) Methods of procedure in cases of the determination of sex and paternity. (*h*) Methods of procedure in cases of offence against morals. (*i*) Methods of procedure in the study of mental conditions. (*j*) Methods of procedure in examination for life and accident assurance. (*k*) Estimation of compensation for injury.

No candidate shall be admitted to any portion of the examination for this diploma until at least one full academic year has elapsed since his graduation in medicine.

The examination shall be both written and practical, and shall extend over a period of not less than three days. It shall be conducted by examiners appointed by the Faculty.

The requirements for the Diploma shall be attendance upon lectures and laboratory work as above outlined, but the Faculty does not accept the responsibility of giving the above course or any part of it other than as may be announced from year to year in the Medical Calendar.

The fee for the diploma and course is $20.

Qualifications for the Degree.*

1st. No one entering after September, 1894, will be admitted to the Degree of Doctor of Medicine and Master of Surgery who shall not have attended Lectures for a period of four nine months' sessions in this University, or some other University, College or School of Medicine, approved of by this University.

2nd. Students of other Universities so approved and admitted on production of certificate to a like standing in this University shall be required to pass all Examinations in

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* *It shall be understood that the programme and regulations regarding courses of study and examinations contained in this calendar hold good for this calendar year only, and that the Faculty of Medicine, while fully sensible of its obligations towards the students, does not hold itself bound to adhere absolutely, for the whole four years of a student's course, to the conditions here laid down.*

Primary and Final Subjects in the same manner as Students of this University.

3rd. Graduates in Arts who have taken two full courses in General Chemistry, including Laboratory work, two courses in Biology, including the subjects of Botany, Embryology, Elementary Phisiology and dissection of one or more types of Vetebrata, may, at the discretion of the Faculty, be admitted as second-year Students, such courses being accepted as equivalent to the first year in Medicine. Students so entering will, however, not be allowed to present themselves for examination in Anatomy until they produce certificates of dissection for two sessions.

4th. Candidates for Final Examination shall furnish Testimonials of attendance on the following branches of Medical Education. ‡ viz. :

Anatomy.	
Practical Anatomy.	
Physiology.	
Chemistry.	
Pharmacology and Therapeutics.	**Of which Two full Courses will be required.**
Principles and Practice of Surgery.	
Obstetrics and Diseases of Infants.	
Gynæcology.	
Theory and Practice of Medicine.	
Clinical Medicine.	
Clinical Surgery.	
Medical Jurisprudence.	
Genesal Pathology.	**Of which One full Course will be required.**
Hygiene and Public Health.	
Paactical Chemistry.	
Ophthalmology and Otology.	
Biology.	
Histology.	
Pathological Anatomy.	**Of which One Course will be required †**
Bacteriology.	
Mental Diseases.	
Pediatrics.	
Medical and Surgical Anatomy.	

‡ Provided, however, that Testimonials equivalent to, though not precisely the same as those above stated, may be presented and accepted.

† Students enregistered in the Province of Quebec are required to attend and pass examinations in Laryngology and Minor Surgery.

He must also produce Certificates of having assisted at six Autopsies, of having dispensed Medicine for a period of three months, and of having assisted at twenty Vaccinations.

5th. Courses of less length than the above will only be received for the time over which they have extended.

6th. No one will be permitted to become a Candidate for the degree who shall not have attended at least one full Session at this University.

7th. The Candidates must give proof of having attended during at least twenty-four months the practice of the Montreal General Hospital or the Royal Victoria Hospital or of some other Hospital of not fewer than 100 beds, approved of by this University. Undergraduates are required to attend only the practice of the Out-Patient departments of the Hospitals during their second year.

8th. He must give proof of having acted as Clinical Clerk for six months in Medicine and six months in Surgery in the wards of a general hospital recognized by the Faculty, of having reported at least 10 medical and 10 surgical cases.

9th. He must also give proof by ticket of having attended for at least nine months the practice of the Montreal Maternity or other lying-in-hospital approved of by the University, and of having acted as assistant at least six cases.

10th. Every candidate for the degree must, on or before the 15th day of May, present to the Registrar of the Medical Faculty testimonials of his qualifications, entitling him to an examination, and must at the same time deliver to the Registrar of the Faculty an affirmation or affidavit that he has attained the age of twenty-one years.

11. The trials to be undergone by the Candidate shall be in the subjects mentioned in Section 4.

12. The following oath of affirmation will be exacted from the Candidate before receiving his degree :

Sponsio Academica.

In Facultate Medicinæ Universitatis.

Ego, A—— B——, Doctoratus in Arte Medica titulo jam donandus, sancto coram Deo cordium scrutatore, spondeo:—me in omnibus grati animi officiis erga hanc Universitatem ad extremum vitæ halitum perserveraturum; tum poro artem medicam caute, caste, et probe exercitaturum; et quoad in me est, omnia ad ægrotorum corporum salutem corducentia cum fide procuraturum; quæ denique inter medendum, visa vel audita silere conveniat, non sine gravi causa vulgaturum. Ita praesens mihi spondenti adsit Numen.

13th. The fee for the Degree of Doctor of Medicine and Master of Surgery shall be thirty dollars, to be paid by the successful candidate to the University Bursar immediately after examination.

VII.

Examinations.

Frequent oral examinations are held to test the progress of the Student, and occasional written examinations are given throughout the Session.

The **Pass** and **Honor** examinations at the close of each Session are arranged as follows :—

FIRST YEAR.

Examinations in **Biology, Histology, Physiology, Anatomy Chemistry, Practical Chemistry and Elementary Bacteriology.**

Students who have taken one or more university courses in Biology or Chemistry before entering may be exempted from attendance and examination. Students exempted in these first year subjects are allowed only a pass standing, but may present themselves for examination if they desire to attain an honor standing. Students exempted from First Year Chemistry must take Second Year Chemistry in their first year.

SECOND YEAR.

Examinations in **Anatomy, Chemistry, Practical Chemistry, Physiology, Practical Physiology, Pharmacology** and **Histology.**

THIRD YEAR.

Examinations in **Pharmacology** and **Therapeutics, Medical Jurisprudence, Public Health** and **Preventive Medicine** (including **Bacteriology**), **General Pathology, Mental Diseases, Clinical Chemistry, Clinical Microscopy, Obstetrics, Medicine** and **Surgery.**

FOURTH YEAR.

Examinations in **Medicine, Surgery, Obstetrics, Gynæcology, Ophthalmology, Clinical Medicine, Clinical Surgery, Clinical Obstetrics, Clinical Gynæcology, Clinical Ophthalmology** and **Practical Pathology.**

By means of the above arrangement a certain definite amount of work must be accomplished by the student in each year, and an equitable division is made between the Primary and Final branches.

A minimum of 50 *per cent. in each subject is required to pass and* 75 *per cent. for honors.*

Candidates must pass in all the subjects of each year; those who fail to pass in not more than two subjects of either the first second or third years may be granted a supplemental examination at the beginning of the following session.

Supplemental examinations will not be granted, except by special permission of the Medical Faculty, and on written application stating reasons, and accompanied by a fee of $5.00 for each subject.

No candidate will be permitted, without special permission of the Faculty, to proceed with the work of the final year until he has passed all the subjects comprised in the Primary examination.

No student will be allowed to present himself for his final examinations who has not certificates of having passed all his Primary examinations in this University.

Candidates who fail to pass in a subject of which practical courses are required may, at the discretion of the Faculty, be required to repeat the course, and furnish a certificate of attendance thereon. A course in Practical Anatomy will be accepted as equivalent to a third course of lectures in General and Descriptive Anatomy.

VIII.

Fellowships, Medals and Prizes.

The Faculty has begun to establish Teaching and Research Fellowships in connection with the various laboratories.

These fellowships are of a value of five hundred dollars per annum, are open only to graduates in Medicine, and are tenable for three years.

Two are now established in connection with the department of Pathology—a Governor's Fellowship endowed by one or two of the Governors of the University, and a Faculty Fellowship established by the Faculty. Other Fellowships will be announced as they are established.

1st. The "**Holmes Gold Medal**," founded by the Medical Faculty in the year 1865, as a memorial of the late Andrew Holmes, Esq., M.D., LL.D., late Dean of the Faculty of Medicine. It is awarded to the student of the graduating class who receives the highest aggregate number of marks in the different branches comprised in the Medical Curriculum.

The Student who gains the Holmes' Medal has the option of exchanging it for a Bronze Medal, and the money equivalent of the Gold Medal.

2nd. **The Final Prize.**—A Prize in Books (or a Microscope of equivalent value) awarded for the best examination, written and oral, in the Final branches. The Holmes' medalist is not permitted for this prize.

3rd. **The Third Year Prize.**—A Prize in Books awarded for the best examination, written and oral, in the branches of the third year.

4th. **The Second Year Prize.**—A Prize in Books for the best examination in all the branches of the second year in course.

5th. **The First Year Prize.**—A Prize in Books for the best examination in all the branches of the first year in course.

6th. "**The Sutherland Gold Medal,**" founded in 1878 by the late Mrs. Sutherland in memory of her late husband, William Sutherland, M.D., formerly Professor of Chemistry in this Faculty. It is awarded for the best examination in General and Medical Chemistry, together with creditable examination in the primary branches. The examination is held at the end of the third year.

7th. The "**Clemesha Prize in Clinical Theraupeutics,**" founded in 1889 by John W. Clemesha, M.D., of Port Hope, Ont. It is awarded to the student making the highest marks in a special clinical examination.

IX.

Fees.

The total Faculty Fees for the whole medical course of four full sessions, including clinics, laboratory work, dissecting material and reagents, will be *five hundred dollars*, payable in four annual instalments of $125 each.

For the convenience of the undergraduates, the Hospital fees are payable in the Registrar's office; ten dollars to be paid at the beginning of each of the last three sessions, viz., the second, third and fourth years. This will entitle each undergraduate to perpetual tickets for both the Montreal General and Royal Victoria Hospitals.

Partial students will be admitted to one or more courses on payment of special fees. An annual University fee of three dollars is charged students of all the faculties for the maintenance of college grounds and athletics.

Students repeating the course of study of any Academic session are not required to pay full fees. A fee of thirty five dollars will be charged, which will include Hospitals, dissecting material, chemical reagents, laboratory fees, etc. The same fee is charged students entering from other colleges who have already paid elsewhere fees for the courses taken.

An *ad eundem gradum* fee of $10 will be charged students entering from another university in the second, third or fourth year of the course.

All fees are payable in advance to the Registrar, and except by permission of the Faculty will not be received later than October 20th.

It is strongly recommended to parents or guardians of students that the fees be transmitted direct by cheque or P.O. Order to the Registrar, who will furnish official receipts.

For Graduation Fees, see page 313.
For Hospital Fees, see page 329.

X.

Text Books.

ANATOMY.—Gray, Morris, Quain (Eng. Ed.), Gervish.

PRACTICAL ANATOMY.—Cunningham's Practical Anatomy, Ellis' Demonstrations, Holden's Dissector and Landmarks.

PHYSICS.—Balfour Stewart.

INORGANIC CHEMISTRY.—Remsen, Wurtz's Elementary Chemistry.

ORGANIC CHEMISTRY.—Remsen.

PRACTICAL CHEMISTRY.—Odling, Sollman.

PHARMACOLOGY AND THERAPEUTICS.—Butler, White, Hare and Wood.

PHYSIOLOGY.—Foster and Shore's Physiology for Beginners, Mills' Text-Book of Animal Physiology, Foster's Physiology, G. N. Stewart's Physiology, Mills' Class Laboratory Exercises.

PATHOLOGY.—Zeigler, Coats'.

PRACTICAL PATHOLOGY.—Mallory and Wright, Delafield & Prudden, Boyce.

BACTERIOLOGY.—Muir & Ritchie, Abbott.

HISTOLOGY.—Klein's Elements, Schafer's Essentials of Histology, Stohr.

SURGERY.—Holmes, Moullin, Walsham, Erichsen, Treves, American Text-Book of Surgery, Da Costa.

PRACTICE OF MEDICINE.—Osler, Tyson, Wood and Fitz.

CLINICAL MEDICINE.—Musser's Medical Diagnosis; Simon, Klemperer, Rainy and Hutchison, Vierort's Medical Diagnosis.

MEDICAL JURISPRUDENCE.—Reese, Guy and Ferrier, Mann.

MENTAL DISEASES.—Insanity and its Treatment, Blandford, 4th Ed.

NERVOUS AND MENTAL DISEASES.—Church and Paterson, 2nd ed.

OBSTETRICS.—Jewett, Hirst, American Text-Book and Evans' Pocket Text-Book.

DISEASES OF CHILDREN.—Holt, Rotch, Smith and Starr.

GYNÆCOLOGY.—Hart and Barbour, Garrigues, Webster, Dudley on Diseases of Women.

HYGIENE.—Davies, Wilson, Rohe, Whitelegge, Harrington, Abbott's Transmissible Diseases.

BIOLOGY, BOTANY.—Gray's Text-Book of Histology and Physiology; ZOOLOGY, Shipley and Macbrides' Introduction to Zoology.*

OPTHALMOLOGY.—De Schweinitz, Nettleship and Swanzy.

OTOLOGY.—Pritchard, Dalby.

LARYNGOLOGY.—Watson Williams, Grumwald's Atlas of Diseases of Larynx.

of Diseases of Larynx.

OPERATIVE SURGERY.—Jacobson, Treves, Kocher.

DERMATOLOGY.—Malcolm Morris, Hyde, Crocker, Unna.

MEDICAL DICTIONARY.—Gould, Dunglison, Hoblyn.

XI.

Museums.

The Faculty has during recent years devoted special attention to the development of its museums in the several departments in which objective teaching is of especial value in the education of the student.

There are now four museums in the Medical Building: (1) the Museum of Pathology, (2) the Anatomical Museum, (3) the Museum of Public Health and Preventive Medicine, (4) the Museum of Pharmacy.

Each collection is arranged and selected with the primary object of making it a teaching museum. The several collections are open to students and the public between 9 a.m. and 5 p.m.

Pathological Museum.

PROF. J. G. ADAMI, DIRECTOR.
MAUD E. ABBOTT, B.A., M.D., ASSISTANT CURATOR.
M. JULES BAILLY, OSTEOLOGIST AND ARTICULATOR.

For the past fifty years the rich Pathological Material furnished by the Montreal General Hospital has been collected here. The Faculty is also greatly indebted to many medical

* Each student will be required to pay $2.50 in order to cover the cost of a class book, dissecting instruments and other necessaries which are supplied to him and become his property.

men throughout Canada and different parts of the world for important contributions to the Museum.

During the past few years, numerous and extremely important additions have been made to the Medical Museum.

It is particularly rich in specimens of Aneurisms. In addition to containing a large number of the more common varieties of these formations, there are specimens of such rare conditions as Aneurism of the Hepatic and Superior Mesentric Arteries, Traumatic Aneurism of the Vertebral, together with several of the cerebral and pulmonary arteries. The most important collection probably in existence of hearts affected with "Malignant Endocarditis" is also found. The Faculty are indebted to Prof. Osler, late of this University, for this collection.

The Museum contains also a very large collection of different forms of calculi. The Faculty are mainly indebted to Prof. Fenwick for this collection.

During the past eight years, M. Bailly, osteologist and articulator (lately with Tramond of Paris), has been engaged in arranging and mounting the very large number of specimens of disease and injuries of bones which have been accumulating for years. In this collection are to be found examples of fractures and dislocations of the spine, osteoporosis, congenital dislocation of the hip, fracture of the astragalus, multiple exostoses, etc., etc.

The Pathological Museum has recently undergone complete alteration. All the old fixtures have been removed, a new gallery has been erected about both rooms reached by a single staircase in a small intermediate room in which is placed the medico-legal collection.

The first room on entering contains the extensive bone collection and calculi. The second and larger room is reserved for the moist preparations, which are arranged so as to be of easy access for the student. Water color drawings made from the fresh specimens are mounted on swinging frames, and also form a frieze at the ceiling. These serve to

recall the fugitive colors of those preparations which become more or less altered on keeping.

Numerous specimens have been contributed from the surgical and medical wings of the Royal Victoria Hospital, and from the different departments of the Montreal General Hospital.

Museum of Hygiene.

DIRECTOR, WYATT JOHNSTON.

This Museum has been established from the interest accruing through the endowment of the Chair of Hygiene by Lord Strathcona and Mount Royal in 1893.

In order to facilitate study and reference, the specimens in the Museum have been all classified upon a decimal system under the followings sections :—

1. *External Hygienic Conditions.*—Air, Soil, Meteorology, Climate.

2. *Personal Hygiene.*—Food and Diet, Bathing, Clothing, Special Life Periods.

3. *Analytical Hygiene.*—Apparatus, etc., for Sanitary Analysis.

4. *Architectural Hygiene.*—House Sites, Plans, Materials, Construction, Ventilation, Heating and Lighting, Sanitary Fittings.

5. *Municipal Hygiene and Sanitary Engineering.*—Water Supply, Sewage, Drainage, Refuse disposal, Street hygiene, Disposal of the dead.

6. *Collective Hygiene.*—Hygiene of Occupation, Offensive Trades, Accident prevention, Hygiene of Schools, Prisons, Asylums, etc.

7. *Infectious Diseases.*—Pathogenic Bacteria and Fungi, Animal Parasites, Public Diagnosis and care of Infectious Diseases, Quarantine, Disinfection, the Communicable Diseases of Animals.

8. *Sanitary Administration.*

9. *Vital Statistics.*

In addition to the regular Museum Exhibit, there is a collection of over 1,000 lantern slides illustrative of phases of Hygiene. The slides have been so arranged as to be available for demonstrations as hand specimens. These slides as well as all the specimens in the Museum are card catalogued, and a projecting lantern is available for their demonstration.

The following are some of the principal exhibits:—Set of Knight's diagrams and models; working models illustrating house drainage, closets, etc., sewer air, movements of soil air; Doulton's models, of drainage, damp proof construction, absorption of moisture in building materials, ventilation appliance, combined heating and ventilation automatic regulation of heating and ventilation ; building materials ; fire proofing. Estimation of carbonic acid and moisture in the air ; meteorological observation ; water supply, water piping ; water filtrations of public and domestic supplies ; polution of water supplies; ground water level; sewage and refuse disposal. Food supply; food adulteration; examination of milk supplies. Disinfection, disinfectants.

The following donations have been received during the year :—

Johnson Electric Service Company of Buffalo—Model of Automatic Heat Regulator.

Ogilvie Brothers, Montreal—Apparatus for testing efficiency of closets, traps, etc.

Frank-Jenner Fire-Proofing Company, New York—Specimens of Lignolith.

J. W. Hughes, Montreal—Sample of defective plumbing.

Canadian Asbestos Company—Sample of covering for steam pipes.

Anatomical Museum.

DIRECTOR, PROFESSOR F. J. SHEPHERD.

M. JULES BAILLY, OSTEOLOGIST AND ARTICULATOR.

This Museum occupies a large room on the same floor and adjoining the Anatomy Lecture Room and Dissecting Room.

Smaller apartments in connection are used for private research, which is encouraged in epery way by the Faculty.

The Museum is well furnished and comfortable, and students have every opportunity of studying Human, Comparative and Applied Anatomy.

This department has during the past few years added a very complete collection of plaster and papier mache models by Steger, after the well-known works of His and Braune, comprising :

(*a*) A complete set of Steger's brain sections.

(*b*) Models of the cerebro-spinal and sympathetic nervous systems.

(*c*) Professor Cunningham's well-known and beautiful casts of the head showing the relation of the cerebral convolutions to the skull and its sutures.

A large collection of human brains, made by Professor Osler, formerly of this University, exhibiting the various types and extremes.

A large and rare collection of anomalies of the Renal vessels and ureter, and the aorta and its branches.

In Comparative Anatomy the student will find a fair amount of material, the study of which will greatly aid him in the elucidation of many points in Human Anatomy.

Many skeletons mounted by Mons. Jules Bailly, Articulator to the University, representing the various classes, orders, genera and species of the animal kingdom may be consulted.

A large collection, showing the pectoral girdle in birds, has been prepared under the supervision of the Professor of Anatomy.

Moist and dry preparations of dissections, a large collection of frozen cross sections of the human body, showing the normal relations of the viscera, etc., will be found convenient for study.

XII.

Library.

LIBRARIAN, PROF. F. G. FINLEY.
ASSISTANT LIBRARIAN, MISS M. R. CHARLTON.

The Library of the Medical Faculty now comprises upwards of twenty-three thousand volumes, the largest special library connected with a medical school on this continent.

The valuable libraries of the late Professors Robert Palmer Howard, George Ross, Richard L. MacDonnell, T. Johnston Alloway and of Dr. Allen Ruttan have been donated to the Medical Faculty.

The standard text-books and works of reference, together with complete files of the leading periodicals, are on the shelves. Students may consult any work of reference in the library between 9 a.m. and 6 p.m. A large library, reading-room for the use of students is provided.

Extracts from the Library Regulations.

I. During the College Session the Library is open daily (except Sundays and general public holidays) from 9 a.m. till 6 p.m., and from 7 to 10 every evening. During vacation from 10 a.m. to 5 p.m.

II. The stack room is not open to students or to the public.

III. The books in the Library are classed in two divisions : 1st, those which may be taken from the Library; 2nd, those which may not, under any circumstances, be removed from the Library. The latter class includes all catalogues, dictionaries and encyclopedias.

IV. Students will be allowed to use regular text-books only in the Library. Any other book map be taken out at 5.30 p.m. to be returned the next day. If books so removed from the Library are not returned punctually, a fine will be imposed, and if the delay be serious the student may be suspended from use of the Library at the discretion of the Librarian.

V. Students may take out books, subject to the above regulations, to the number of three volumes at one time.

VI. Books may be taken from the Library only after they have been especially asked for and charged at the delivery desk ; borrowers who cannot attend personally must sign and date an order, giving the titles of the books desired and the name of the person deputed to procure the same.

VII. Damage to or loss of books shall be made good to the satisfaction of the Librarian and of the Library Committee. Writing or making any mark upon any book belonging to the Library is unconditionally forbidden. Any persons found guilty of wilfully damaging any book in any way shall be excluded from the Library, and shall be debarred from the use thereof for such time as the Library Committee may determine.

VIII. Silence must be strictly observed in the Library.

IX. Infringement of any of the rules of the Library will subject the offender to a fine or suspension of his privileges, or to such other penalty as the nature of the case may require.

The number of volumes presented to the Library from Nov. 1st, 1900, to Oct. 31st, 1901	1,093
Those added by purchase.	89
Total additions to November, 1901	1,172
The attendance of readers	9,848
June 15th, 1900, has been	9,956
The attendance from June 2nd, 1897, to May 14th, 1898, was	6,350
The attendance from June 1st, 1896, to June 1st, 1897, was	5,920
The attendance from June 1st, 1895, to June 1st, 1896, was	4,875
The number of books taken out for home use has been	5,803
The number of Journals and pamphlets has been . .	264

This does not include the works consulted in the Library.

The Faculty has endeavored to make the Library as complete as possible for research work. Complete files of almost all the important periodicals are now on the shelves, including foreign as well as English and American journals. A large number of transactions of various societies has recently been acquired, and also the Berlin and Paris theses.

Arrangements have been made whereby practitioners both in the city and country can avail themselves of the library, the only conditions being the payment of express charges and a guarantee for the safe return of books borrowed.

XIII.

McGill Medical Society.

This Society, composed of enregistered Students of the Faculty, meets every alternate Saturday during the Autumn and Winter Terms, for the reading of papers, case reports and discussions on medical subjects. A prize competition has been established in senior and junior subjects, the senior being open to all to write upon, while only the 1st, 2nd and 3rd year students are allowed to compete in the junior subjects. The papers are examined by a board elected from the Professoriate, and a first and second prize in each division of subjects is awarded to the successful candidates.

Names of competitors and titles of papers shall be sent to the Chairman of the Programme Committee before September 1st, and all papers shall be subject to the call of the Committee on October 1st. All papers shall be handed in for examination on or before January 10th.

The Students' reading room has been placed under the control of this Society, in which the leading English and American Medical Journals are on file, as well as the leading daily and weekly newspapers of the Dominion.

The annual meeting is held the first week of the Spring Term, when the following officers are elected : Hon. Pres-

ident, elected from the Faculty ; President, Vice-President, Secretary, Assistant Secretary, Treasurer, Reporter, Pathologist, and three Councilmen (of whom two shall be elected from the Faculty).

XV.

Hospitals.

The City of Montreal is celebrated for the number and importance of its public charities. Among these its public hospitals are the most prominent and widely known. Those in which medical students of McGill University will receive clinical instruction are : (1) The Montreal General Hospital. (2) The Royal Victoria Hospital. (3) Montreal Maternity Hospital.

The Montreal General Hospital has for many years been the most extensive clinical field in Canada. The old buildings, having proved inadequate to meet the increased demand for hospital accommodation, have recently been increased by the addition of two surgical pavilions, the Campbell Memorial, and the Greenshields Memorial, and of a new surgical theatre. The interior of the older buildings now has been entirely reconstructed on the most approved modern plans.

The Royal Victoria Hospital at the head of University Street, which in structure and arrangements ranks among the finest modern hospitals of either continent, was opened for the reception of patients the first of January, 1894, and affords exceptional opportunities for clinical instruction and practical training.

Montreal General Hospital.

This Hospital consists of a Surgical, a Pathological and a Medical Department.

The Surgical Department has two large pavilions, containing four wards 135 feet long by 35 broad, with an intervening and connecting building in which is a large operating

theatre of the most modern type, capable of seating over 350 students. In connection with this are preparation, etherising, instruments, stertilising and surgeons' rooms, also smaller operating rooms. The Surgical pavilions, which were built three years ago, accommodate over one hundred patients.

The old part of the hospital, consisting of the Reed, Richardson and Morland wings, has during the past year been completely rebuilt and remodelled, and forms the Medical Department. This part contains four wards, 100 feet by 40, and is arranged for 150 beds. In this building there are wards for Gynaecological and Opthalmological patients, a number of private wards and laboratories for Clinical Chemistry. There is also a medical amphitheatre capable of seating 150 students and a gynaecological operating room fitted up in the most modern manner. The central part of the old building is for administration purposes.

A completely new and commodious out-door patient department has been provided on the ground floor of the Richardson wing, and there is ample accommodation for the various special departments as well as large rooms for general medical and surgical patients.

The Pathological Department is a completely new building in which are the post-mortem theatre and rooms for microscopical and bacteriological work, and also a mortuary and chapel. In this building students are offered every opportunity of perfecting their knowledge of morbid anatomy and pathological histology.

The old Fever Wards on the grounds of the Hospital have been completely remodelled, and are now used as a laundry and kitchen.

A much larger number of patients receive treatment in the Montreal General Hospital than in any other Canadian Hospital. Last year's report shows that between two and three thousand Medical and Surgical cases were treated in the wards, and the great proportion of these were acute cases, as may be

gathered from the fact that the average duration of residence was only 24.02 days. Upwards of thirty-two thousand patients are annually treated in the out-door department of this Hospital.

The Royal Victoria Hospital.

This Hospital is situated a short distance above the University Grounds on the side of the Mountain, and overlooks the city. It was founded in July, 1887, by the munificence of Lord Mount Stephen and Lord Strathcona, who gave half a million dollars each for this purpose.

The buildings, which were opened for the reception of patients on the first of January, 1894, were designed by Mr Saxon Snell of London, England, to accommodate between 250 and 300 patients.

The Hospital is composed of three main buildings connected together by stone bridges ; an Administration Block in the centre and a wing on the east side for medical patients, in immediate connection with which is the Pathological wing and mortuary, and a wing on the west side for surgical patients.

The Administration block contains ample accommodation for the resident medical staff, the nursing staff and domestics. The patients' entrance, the dispensary and admission rooms are also situated in this building. To the north of the Administration block has been erected a large out-patients' department, in which are special departments for Minor Surgery, Ophthalmology, Laryngology, and Gynaecology. This wing was opened for patients during the winter of 1899-1900.

The Medical wing contains three large wards, each 123 feet long by 26 feet 6 inches wide, one ward 40 feet by 26 feet 6 inches, and fifteen private and isolation wards averaging 16 feet by 12 feet. Also a medical theatre with a seating capacity for 250, and three rooms adjacent to it for clinical chemistry and other purposes. North of this wing and in direct connection with it are the Pathological laboratories and mortuary.

In this wing are situated the mortuary proper, the chapel, a post mortem room capable of accommodating 200 students, and laboratories for the microscopic and bacteriological study of morbid tissues, some designed for the use of students and others for post graduation courses and special research. Special laboratories for Pathological Chemistry, Experimental Pathology, Bacteriology and Photography are also provided.

The Surgical wing contains three large wards, each 123 feet long by 26 feet 6 inches wide, four wards each 40 feet by 32 feet, and seven private and isolation wards, averaging 16 feet by 12 feet ; also a surgical theatre with a seating capacity for 250, with six rooms adjacent for preparations and after recovery purpcses.

In this wing are also the wards for Gynaecology and Ophthalmology. There is also an Isolation Pavilion for infectious diseases.

Hospital Fees.

Annual tickets entitling students to admission to both the Montreal General and the Royal Victoria Hospitals must be taken out at the commencement of the session, price $5.00 each. These are obtained at the College. Perpetual tickets will be given on payment of the third annual fee.

XVI.

CLINICAL INSTRUCTION.

During the Session of 1901-1902, three Medical, three Surgical, two Gynaecological and two Ophthalmological clinics will be held weekly in both the Montreal General and Royal Victoria Hospitals.

In addition, tutorial instruction will be given in these different departments in the wards, out-patient rooms and laboratories. Special weekly clinics will be given in the Montreal General Hospital on Dermatology and Laryngology and in

the Royal Victoria Hospital on diseases of the Genito-Urinary system, Laryngology and Neurology.

Clinical Clerks in the medical and surgical wards of both Hospitals are appointed every three months, and each one during his term of service conducts, under the immediate directions of the Clinical Professors, the reporting of all cases in the ward allotted to him. Students entering on and after October, 1893, are required to show a certificate of having acted for six months as clinical clerk in medicine and six months in surgery, and are required to have reported at least ten cases in medicine and ten in surgery. The instruction obtained as clinical clerk is found to be of the greatest possible advantage to Students, as affording a true *practical* training for his future professional life.

Dressers are also appointed to the Out-door Departments. For these appointments, application is to be made to the Assistant Surgeons, or to the resident surgeon in charge of the out-patient department.

The large number of patients affected with diseases of the eye and ear, now attending the special clinics at both hospitals afford ample opportunity to students to become familar with all the ordinary affections of those organs, and to make themselves proficient in the use of the ophthalmoscope; and it is hoped that every student will thus seek to gain a practical knowledge of this important branch of Medicine and Surgery. Operations are performed on the eye by the Ophthalmic Surgeons after the outdoor patients have been seen, and Students are invited to attend the same, and as far as practicable to keep such cases under observation so long as they remain in the Hospital.

There are also special departments in both Hospitals for Gynaecology and Laryngology, directed by Specialists in these branches. Students are thus enabled to acquire special technical knowledge under skilled direction. The plan of teaching practical gynaecology for the past five years with

marked success has been the limitation of the number of Students attending each clinic to four.

The Clinics at the Montreal General Hospital in Dermatology and in both hospitals in Laryngology are very large, and afford a practical training in affections of the skin and throat rarely obtained by medical students.

A special clinic for diseases of the Genito-Urinary Organs has been established at the Royal Victoria Hospital.

Infectious diseases and Insanity will also be taught clinically, the former in the special wards for infectious diseases and the latter at the Verdun Hospital for the Insane.

The Montreal Maternity.

The Faculty has great pleasure in announcing that the Corporation of the Montreal Maternity has made very important additions to its building, and has in contemplation the erection of a large new building, fitted with the most modern appliances. The new Hospital will be situated at the corner of Prince Arthur and St. Urbain Streets. Plans and specifications for it are now about complete. Students will therefore have greatly increased facilities for obtaining a practical knowledge of obstetrics and diseases of infancy. An improved Tarnier-Budin phantom is provided for the use of the students, and every facility afforded for acquiring a practical knowledge of the various obstetric manipulations. The institution is under the direct supervision of the Professor of Midwifery, who devotes much time and attention to individual instruction. Students who have attended the course on obstetrics during the autumn and winter term of the third year will be furnished with cases in rotation, which they will be required to report and attend till convalescence. Clinical midwifery has been placed upon the same basis as Clinical Medicine and Surgery, and a final Clinical examination instituted. Regular courses of clinical lectures are given throughout the session, special attention being paid to the

important subject of infant feeding. The Walker-Gordon process of modifying milk is explained and demonstrated. During the autumn and winter terms the Demonstrator of Obstetrics gives Clinical Demonstrations in the wards and instruction in operative work on the phantom. Students will find it very much to their advantage to pay special attention to their Clinical work during the spring term of the third year and the following summer. One resident medical officer is appointed yearly from the graduating class to hold office for a period of six months.

Fee for twelve months, $12, payable at the Maternity Hospital.

Hospital Appointments.

The Resident Medical and Surgical Staff of the Montreal General, the Royal Victoria and the Maternity Hospitals, is selected by examination from the members of the graduating class of each year. There are from fifteen to twenty such appointments made annually which are tenable for from one to three years, while a number of them carry a small salary with them. The following students of the graduating class of 1901 received hospital appointments:—

Royal Victoria Hospital:

Surgical Side: Drs. E. Penner, B.A.; H. M. Collison, and T. H. Leggett.

Medical Side: Drs. M. Mackay, B.A.; J. R. Goodall, B.A.; C. K. Russel, B.A.

Ophthalmology: Dr. S. K. McKee.

Anæsthetist: Dr. B. A. Richards.

Locum Tenens: Drs. E. A. Martin, and E. E. Mcdonald.

Montreal General Hospital:

Drs. J. Bruce, B.A.; R. H. Ker, B.A.; Campbell Howard, B.A.; L. F. Robertson, B.A.; R. P. Campbell, B.A.; J. G. Brown, B.A.; E. H. White, B.A.; B. E. Wiley, and H. B. Rogers.

Maternity Hospital:

Dr. E. G. W. Simpson.

Faculty of Comparative Medicine and Veterinary Science.

The twelfth Session of the Faculty (being the thirty-seventh of the Montreal Veterinary College) will be opened on Saturday, 20th September, 1902. The regular course of lectures will begin on September 23rd, at the hours named in the time table, and will continue till the end of March. The hours of lectures will be announced later, together with the alterations which may be necessary; the course as herein announced being subject to such changes as the Faculty may see fit to make.

The Montreal Veterinary College was inaugurated in 1866.

The complete course of study in this Faculty extends over three years.

Graduates of recognized Veterinary Colleges desirous of taking the degree may do so by attendance on the final subjects for one full session, but will be required to pass the examinations on all the subjects embraced in the curriculum, botany excepted.

Matriculation.

Candidates who intend to practise in the Province of Quebec must comply with the preliminary examination requirements of the Provincial Veterinary Board.

Every student who does not intend to practise in the Province of Quebec and has not complied with the preliminary examination requirements of the Provincial Veterinary Board, must, previous to his admission, produce a certificate of educational requirements satisfactory to the Faculty, or submit himself to a matriculation examination in (1) writing, (2) reading aloud, (3) dictation, (4) English grammar and (5) composition, (6) outlines of geography, with special reference to North America, (7) arithmetic, including vulgar and decimal fractions.

A. N. Shewan, M.A., will hold the matriculation examination on Saturday, 20th September, 9 a.m., at the College, 6 Union Avenue, when all those intending to enter the course should present themselves for examination. Candidates possessing certificates of education or of previous matriculation should produce them for the inspection and approval of the examiner. Graduates of any Faculty in a recognized University or Agricultural College are not required to matriculate.

No College is recognized unless its students are required to matriculate.

Registration and Payment of Fees.

The following are the College regulations:—

All students desirous of attending the classes shall, at the commencement of each session, enrol their names and residences in the register of the Faculty, and procure from the University Registrar a ticket of registration, for which each student shall pay a fee of $5.

The said register shall be closed on the last day of October in each year. The fees are payable to the Registrar of the University, and all class tickets will be issued by him, *and must be paid in advance* at the time of registration ; the Registrar will on no consideration issue tickets till the fees are paid. Intending students must govern themselves accordingly.*

Unless excused for special reasons by the Faculty, every student will be required to register on Saturday, September 21st. Failure to register on that date or absence from any of the lectures of the session without sufficient cause, or failure to remain until the close of the examinations, may, at the discretion of the Faculty, cause loss of sessional standing.

All students must register, including those who receive free bursaries.

Fees for the whole course are $75 per session, and, in all cases, must be paid on entering. Matriculation fee, $5, which

* Owing to losses incurred by non-payment of fees, the Registrar must refuse registration till the fees are paid, which may be returned if the applicant fails to matriculate.

is to be paid prior to the examination; $5 for registration; and $5 for registration, payable at the beginning of each of the following two Sessions, and $20 on receiving the diploma. Students who are allowed time for previous study will be required to pay full fees, and $5 for registration each session. Payments must be made in all cases as above.

In addition to the above Faculty fees, every student must pay an annual fee of $3 for athletics.*

Students of the Province of Quebec.

In consideration of the annual grant, the Council of Agriculture has the privilege of sending thirteen pupils, free of expense, to the whole course; such students, however, pay a fee of $5 for the course in Botany, $5 annually for registration, and $3 annually for athletics. These bursaries may be obtained by young men resident in the Province of Quebec, by application made to the Dean of the Faculty in the handwriting of applicant, accompanied by a recommendation from the Agricultural Society of the district in which they reside, provided the Council considers them qualified by education and in other respects for entering the College.

In all cases, except when specially arranged, Bursars will be required to give a guarantee that they will attend three Sessions, and failing to do so, they shall be required to pay the fees for the Sessions which they have attended. These Bursaries are not intended for nor will they be given to such students as do not require such aid.

Special Regulations.

Students of this Faculty will be graded as of the first, the second, and the final year. In each year students will take the studies fixed for that year only, unless by special permission of the Faculty.

* *First Year, Fees*	$ 75	*Second Year, Fees*	$ 75	*Third Year, Fees*	$ 75
Matriculation "	5	Registration "	5	Registration "	5
Registration "	5	Athletics "	5	Athletics "	3
Athletics "	3			Diploma "	20
	$ 88		$ 83		$103

Persons desirous of entering as Partial Students shall apply to the Dean of the Faculty for admission as such, and shall obtain a ticket or tickets for the class or classes they desire to attend.

Each lecture shall be of one hour's duration, but the Professors shall have the right to substitute an examination for any such lecture.

At the end of each term there shall be a general examination of all the classes, under the superintendence of the Professors, and such other examiners as may be appointed by the Corporation. The results shall be reported as early as possible to the Faculty. Students of either the First or the Second Year who fail to pass satisfactory examinations in any subject at the close of the Session must pass in the same before proceeding with the work of the succeeding year. For such supplemental examination a fee of two dollars will be charged.

The students have all the privileges of the McGill Medical Faculty's Laboratories.

Physiological Laboratory.

The Physiological Laboratory is supplied with the most modern apparatus for the practical teaching of this most important branch of the medical curriculum. It contains, amongst other valuable instruments, kymographs, various manometers, etc., for demonstrating blood pressure; myographs, rheocords, moist chambers, etc., and various electrical appliances for demonstrating experiments in connection with nerve and muscle; special apparatus for illustrating various points in respiration; apparatus specially suitable for demonstrating the processes of digestion, as well as the chemical composition and nature of the secretions, and the chief constituents of the tissues and nutritive fluids. The laboratory is arranged so as to permit of Students engaging in practical work for themselves under skilled guidance. During the past session, important additions of apparatus have been made to the Physiological Laboratory.

Chemistry.

The course of Chemistry embraces Chemical Physics, in the first portion of the course, the theory of Chemistry, both inorganic and organic, in the latter part of the course. The Chemical Laboratory, which is available to the Students of Comparative Medicine, is large, lofty and well lighted, and can accommodate comfortably 76 men at one time. Each Student, when entering on his course, has a numbered table in the laboratory assigned to him for his use during the session. Each table has its own gas and water fixtures, and is provided with shelves for its corresponding set of reagent bottles, as well as a drawer and locker containing a modern set of chemical apparatus especially adapted for the work. This apparatus is provided by the Professor of Chemistry, and supplied to each Student without extra charge. The Student is required to pay only for apparatus broken or destroyed.

The laboratory is furnished with a large draught closet for ventilation, sulphuretted hydrogen apparatus, gas and combustion furnaces, etc., giving to the student unsurpassed advantages for acquiring a sound and practical knowledge of medical chemistry.

Pathological Laboratory.

In the Pathological Laboratory accommodation will be provided for Students or practitioners who desire to carry on advanced study or private pathological research. The laboratory has been entirely re-built recently, and is well stocked with the usual apparatus for pathological and bacteriological work.

The demonstrations in Morbid Anatomy will be given in a small laboratory, specially arranged for the work. The classes in Pathological Histology will be held in the Pathological Laboratory.

The Pathological Laboratory, having on the upper floor the Class and Demonstration room, is fully fitted with micro-

scopes and other apparatus for the purpose of Pathological Histology and Bacteriology. Upon the first floor are the Library and Professor's room, the Preparation and Research rooms, with a smaller Incubator room for Bacteriological use. On the ground floor are situated the animal store rooms and the apartments of the assistant.

Accommodations will be provided for students or practitioners who desire to carry on advanced study or pathological research.

COURSES OF LECTURES.

Botany.

PROFESSOR:—D. P. PENHALLOW, M.Sc.

Instruction in Botany, obligatory upon all First Year students, will occupy three hours per week throughout the session. The course will deal chiefly with laboratory methods, and is designed to give the student practical familiarity with the characteristics of useful and injurious plants and the methods of their determination, and also to introduce the general principles of nutrition, growth and other leading functional activities.

Chemistry.

PROFESSOR:—GILBERT P. GIRDWOOD, M.D.

Inorganic Chemistry is fully treated; a large portion of the course is devoted to Organic Chemistry and its relations to Medicine. The branches of Physics bearing upon or connected with Chemistry also engage the attention of the Class. For experimental illustration, abundant apparatus is possessed by the College.

The Chemical Laboratory will be open to members of the Class to repeat experiments performed during the course, under the superintendence of the Professor or his Assistant.

Physiology.

PROFESSOR:—T. WESLEY MILLS, M.A., M.D., D.V.S.

The purpose of this course is to make students thoroughly acquainted so far as time permits, with modern Physiology,

its methods, its deductions, and the basis on which the latter rest. Accordingly, a full course of lectures is given, in which both the Experimental and the Chemical departments of the subject receive attention.

In addition to the use of diagrams, plates, models, etc., every department of the subjects is experimentally illustrated.

Laboratory work for Senior Students:—

(1) During a part of the Session there will be a course on Physiological Chemistry, in which the student will, under direction, investigate food-stuffs, digestive action, blood, and the more important secretions and excretions. including urine. All the apparatus and material for this course will be provided.

(2) The remainder of the session will be devoted to the performance of such experiments as are unsuitable for demonstration to a large class in the lecture room and such as require the use of elaborate methods, apparatus, etc. The course for first year students is similar to that for senior students, though less advanced, and more attention will be given to the anatomico-physiological aspects of the subject than to the chemical. It has been arranged that additional practical work shall be done by the students themselves in the Laboratory during next and succeeding sessions.

Histology.

PROFESSOR:—GEO. WILKINS, M.D.

The teaching of Histology and Microscopical Methods is spread over two years. During both years practical instruction will be given upon the preparation and mounting of specimens. Students will also be required to make drawings of the specimens prepared by them.

For the first year students, work will commence immediately after the Christmas holidays and continue until the end of the session. The course will consist of laboratory work and demonstrations, with occasional lectures upon ele-

mentary and systematic histology up to and including the digestive system. At the end of the session a practical examination will be held on the work done.

Comparative Pathology.

PROFESSOR:—J. G. ADAMI, M.D.

ASSISTANT:—C. H. HIGGINS, B.Sc., D.V.S.

The teaching in Pathology at McGill Medical College includes courses in general and special Pathology, in Bacteriology (held during the summer Session), and instruction in the performance of Autopsies. These courses—while directed especially towards giving to the Students a due knowledge of the causation and course of disease in man—are necessarily based largely upon the results of observations upon the lower animals, and the greater part of all these causes is applicable equally to conditions obtaining in the domestic animals. There is in addition a practical course of Pathological Histology for Students of Comparative Medicine, and instruction is given upon the performance of Autopsies upon the lower animals.*

Veterinary Medicine and Surgery.

PROFESSOR:—D. MCEACHRAN, F.R.C.V.S.

Students of all years must attend.

The course embraces the principles and practice of Veterinary Medicine, including the diseases of domestic animals, their nature, causes, symptoms, and treatment. It necessarily includes Pathology and Pathological Anatomy, with daily clinical demonstrations in the hospital and the yard practice of the College, as well as illustrations from plates, preserved specimens, and fresh material furnished by the Pathologist.

The course on Surgery embraces Surgical Anatomy and Practices of Surgery, and will be illustrated by a large collection of surgical appliances.

* Undergraduates in the second or third sessions are particularly recommended to take the practical course in Bacteriology during the summer session, if possible.

The large and varied practice of the College furnishes abundance of cases for demonstration purposes. Attendance and practical work in the Pharmacy and Hospital is compulsory during the entire course, in the order arranged at the beginning of each Session ,and forms an important part of the qualification for graduation.

Anatomy.

PROFESSOR:—M. C. BAKER, D.V.S.
DEMONSTRATOR:—B. A. SUGDEN, D.V.S.

In this course the Anatomy of the horse is the subject of special study, while the structural differences of all the domestic animals are carefully explained and illustrated by fresh subjects. There is a very large collection of anatomical models by Dr. Auzoux, of Paris, natural injections and dissections, and a most complete collection of diagrams, including Marshall's complete set, Mons. Achille Compte's Anatomical and Zoological series; also a large collection of drawings specially prepared for the school by Mr. Scott Leighton, artist, Boston, and Mr. Hawksett, Montreal.

The dissecting room is open at all hours, subjects are easily procured, and either the Professor or Demonstrator will be in attendance to superintend and direct students in practical dissection. The room is furnished with every convenience, is thoroughly lighted, and affords students all that can be reasonably desired.

Students are required to pay for the material necessary for practical anatomy.

Before a student can be allowed to present himself for his pass examination, he must procure tickets certified by the demonstrator that he has dissected two entire subjects,—that is, one each session.

Materia Medica and Therapeutics.

LECTURER:—B. A. SUGDEN, D.V.S.

This course comprises a description of the physiological and therapeutic action of all the more important medicines

used in Veterinary Practice, with a short reference to their general properties and principal preparations. It will also include a course in the practical work of compounding and administering medicines in the pharmacy and hospital. There will also be experimental demonstrations of the action of some of the more important drugs on animals.

Cattle Pathology and Obstetrics.

Professor:—C. McEachran, D.V.S.

A special course on Cattle Diseases and Veterinary Obstetrics will be delivered, embracing the history of Cattle Plagues; their nature, symptoms, pathological anatomy, prophylactic and therapeutic treatment; breeding and general management of breeding animals, disease incident to gestation and parturition, etc.

Special Course on Dogs.

Professor Wesley Mills will give a special Course on Dogs, which will include:—

(1) Lectures on the physical and psychic characteristics of all the leading varieties, illustrated by specimens, plates, etc.

(2) The principles of training; the feeding and general management of dogs.

(3) The principles of breeding; the management of brood bitches and the rearing of puppies.

(4) Bench show management and the public judging of dogs.

(5) The rights and duties of dog owners.

In all the above courses the clinical and pathological aspects of the subject will be considered, as well as the normal; and a regular clinic will also be maintained.

The Museum

Contains a large collection of natural and artificial specimens, consisting of skeletons of almost all the domestic animals, numerous specimens of diseased bones, preparations by

Dr. Auzoux of all the different organs in the body, natural dissections, colored models, diagrams, etc., etc., all of which are used in illustrating the lectures, and to which the students have frequent opportunities of referring. Students will also enjoy the privilege of the Museums of the Medical Faculty of McGill University, which are rich in pathological specimens.

The Pharmacy.

All the medicines used in the practice of the College are compounded by the Students, under the direction of the Professors, from prescriptions for each particular case, and most of them are administered or applied by them. For this purpose they are detailed for certain pharmaceutical duties alternately. By this means they become familiar with the physical properties, compatibilities, doses and uses of the medicines, and become expert in administering them to the different patients brought for treatment. Attendance and practical work in the Pharmacy are compulsory.

The Practice.

The Hospital and Daily Clinics, as well as a very extensive out-door practice, including most of the largest stables in the city and numerous farms in the vicinity, afford excellent opportunities for clinical observation on horses of all breeds and ages. Owing to the numbers of cattle kept in the city, and the valuable thoroughbred herds in the neighbourhood, advanced Students are enabled to see and do considerable cattle practice. The dog practice is the largest in Canada. All canine diseases can be studied clinically, owing to the large number of dogs brought to the College for medical or surgical treatment.

Senior Students will be appointed to act alternately as dressers in the Hospital, and first and second year men must assist in administering medicines and at operations.

*Text Books.

The following text-books are recommended:—

Anatomy.—Chauveau's Comparative Anatomy; Strangeway's Veterinary Anatomy; McFadyean's Veterinary Anatomy; Dissector's Manual, Clement.

Physiology.—Physiology for Beginners by Foster & Shore; Prof. Mills' Text Book of Comparative Physiology; Class Laboratory Exercises, by the same author. Halliburton's Kirkes' Physiology.

Histology.—Klein's Elements; Schafer's Essentials of Histology.

Botany.—Gray's Structural Botany; Bessey's Botany.

Zoology.—Dawson's.

Chemistry.—Wurtz's Elementary Chemistry; Armstrong; Remsen's Organic Chemistry.

Medicine and Surgery.—Williams' Principles and Practice of Veterinary Medicine; Fleming's Sanitary Science and Police; Williams' Surgery; Fleming's Operative Surgery; Robertson's Equine Medicine; Liautard's Operative Veterinary Surgery; Zuill's Translation of Friedberger and Frôhner's Pathology, Moller's Veterinary Surgery (Dollar), etc.

Materia Medica.—Dun's Veterinary Medicines; Walley's Veterinary Conspectus; Tuson's Pharmacy; Hoare's Therapeutics.

Cattle Diseases.—Steel's Bovine Pathology; Clatter's Cattle Doctor (Armitage); Fleming's Veterinary Obstetrics; Steele on Sheep.

Canine Diseases.—Prof. Mills' The Dog in Health and in Disease; Diseases of the Dog, by Geo. Müller, tr. by A. Glass, V.S.

Entozoa.—Cobbold's Entozoa of Domestic Animals.

Pathology.—Payne's Pathology; Fraenkel's Bacteriology; Clement on Post Mortems.

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* Students are advised not to buy text books extensively till after consultation with the Professor who teaches the subject.

Veterinary Medical Association.

This Association is for the mutual improvement of its members in all matters pertaining to the profession.

Graduates and students of Veterinary Medicine and graduates and students of Human Medicine are eligible to membership.

The meetings are held fortnightly, at which papers are read and discussed, cases reported, etc.

The advantages which students derive from these meetings are very great. Not only do they hear carefully prepared papers on subjects of professional importance, but an opportunity is afforded for practising public speaking, which in after life is often extremely useful. The fees of the Association are expended in the purchase of books for the Library, drugs for experimental purposes, and the prizes awarded for papers read.

The Library is owned by the Association, and is under the control of officers who are elected annually. It contains nearly 600 volumes, embracing works of great antiquity, as well as the modern works on Veterinary Science and collateral subjects, in both the English and French languages, all of which are available for consultation and study by members.

Every student is expected to become a member. The entrance fee is $5, and the yearly subscription $2.50. A Diploma of Honorary Fellowship is conferred on all members who have complied with the regulations of the Association.

Association for the Study of Comparative Psychology.

This Society is similar in constitution to the Veterinary Medical Association, and has a special library of about 100 volumes. Its object is the study of the Psychic Phenomena (intelligence, etc.) of all classes of animals, and the diffusion of sound views on this subject. Naturally, it is of great importance in the practice of medicine upon dumb animals as well as of peculiar scientific interest.

Qualifications for the Degree.

Candidates for the Final Examination shall furnish testimonials of attendance on lectures on the following subjects.

Either Botany or Zoology—One course of six months, 1st year.

Physiology, Histology, Anatomy, Chemistry — Two courses of six months, 1st and 2nd years.

General Pathology and Demonstrations, one course of six months.

Cattle Diseases and Obstetrics.

Practice of Medicine and Surgery. — Two courses, 2nd and 3rd year.

Materia Medica and Therapeutics.

No one will be permitted to become a candidate for examination who shall not have attended at least one full course of lectures in this Faculty, including all the subjects embraced in the curriculum. Courses of less length than the above will be received only for the time over which they have extended.

Students, except by special permission of the Faculty, must pursue the subjects of Anatomy, Physiology, Chemistry, Histology, and Botany or Zoology in their session.

Candidates of the 1st and 2nd years, who fail to pass in not more than two subjects, may be granted a supplementary examination at the beginning of the following session. Supplementary examinations will not be granted, except by special permission of the Faculty and on written application stating reasons, and on payment of a fee of $2.50, which must be paid prior to examination.

Candidates who fail to pass in a subject of which two courses are required, may, at the discretion of the Faculty, be required to attend a third course, and furnish a certificate of attendance thereon.

In addition to the written and oral examinations, candidates must pass a practical clinical test, including examination of horses for soundness, written reports being required; the clinical reports to include diagnosis, prognosis, and treatment.

The following oath or affirmation will be exacted from the candidate before receiving the degree:—I, —— ——, promise and solemnly declare that I will, with my best endeavors, be careful to maintain the interests of this University, and that, to the best of my ability, I will promote its honor and dignity.

Examinations.

First Year.—Pass Examinations in Botany or Zoology, Histology (oral), 1st Chemistry, Anatomy, Physiology, and on all other subjects in the course of this year.

Second Year.—Pass examinations in Chemistry, Physiology, Histology (written), and Anatomy, in addition to sessional examinations in these and the other subjects of the year.

Third Year.—Pass examinations in Practice of Medicine and Surgery, General and Special Pathology, Veterinary Obstetrics, Diseases of Cattle, and Materia Medica and Therapeutics and Anatomy.

Written and Oral Examinations will be held from time to time during the session, and attendance at these is compulsory. The standing attained at these examinations will be taken into account at pass examinations.

Age for Graduation.

Students under seventeen will be received as apprentices, but cannot be entered as regular Students before attaining that age.

Minors may pass the Examinations, but cannot receive the Diploma until they are twenty-one years of age.

Regulations Governing the Conferring of the Degree Upon Former Graduates of the Montreal Veterinary College.

The Degree of Doctor of Veterinary Science may be conferred on former graduates of Montreal Veterinary College at any Convocation of McGill University held for conferring degrees, subject to the following regulations, which were adopted at a meeting of the Corporation of McGill University, held on the 22nd January, 1890, governing the conferring of Degrees on former graduates:—

1st.—That the candidate must be found to have conducted himself throughout his professional career with honor and integrity.

2nd.—That he has not been connected with the manufacture or sale of proprietary medicines.

3rd.—That he has been engaged in actual practice for at least one year since graduating, or that he has been engaged in professional study at some European school.

4th.—That he shall be required to satisfy the Board that he has made reasonable progress in professional knowledge and skill.

In estimating the fitness of a candidate for a degree, account will be taken specially of work done in professional teaching, original research, publication of books or contributions to the journals of the profession.

The fee for the Diploma shall be Twenty Dollars.

An affirmation shall be administered similar to that of other Faculties, and in English.

The Degree may be conferred on absentees.

The regulations relating to fees and affirmations shall apply to ordinary undergraduates on taking the degree.

Graduates intending to apply for the Degree of D.V.S. should notify the Registrar of the Faculty at their earliest convenience, and at the same time state the grounds explicitly on which they base their claims for the Degree.

McGill Normal School.

The McGill Normal School, in the city of Montreal is established chiefly for the purpose of training teachers for the Protestant population, and for all religious denominations of the Province of Quebec, other than the Roman Catholic. The studies in this school are carried on chiefly in English, but French is also taught.

Government of the School.

The Corporation of McGill University is associated with the Superintendent of Public Instruction in the direction of the McGill Normal School, under the regulations of the Protestant Committee of the Council of Public Instruction, and it is authorized to appoint a standing committee consisting of five members, called the "Normal School Committee," which shall have the general supervision of the affairs of the Normal School. The following members of the Corporation of the University constitute the committee of the Normal School for the Session of 1902-1903.

Normal School Committee.

PROF. W. PETERSON, C.M.G., LL.D., Principal of the University, Chairman.
MR. SAMUEL FINLEY, Governor of McGill College.
REV. PRINCIPAL MACVICAR, D.D., LL.D., } Fellows of
J. R. DOUGALL, M.A., } McGill University.
REV. E. I. REXFORD, M.A., }
J. W. BRAKENRIDGE, B.C.L., Secretary.

Officers of Instructi

McGILL NORMAL SCHOOL.

SAMPSON PAUL ROBINS, M.A., LL.D., D.C.L., Principal and Lecturer on Art of Teaching.
ABNER W. KNEELAND, M.A., B.C.L., Ordinary Professor of English Language and Literature.

MADAME SOPHIE CORNU, Ordinary Professor of French.
————— —————, Professor of Drawing.
MISS LILLIAN B. ROBINS, B.A., Assistant to the Principal and Instructor in Classics.
MR. W. H. SMITH, Instructor in Vocal Music.
MR. JNO. P. STEPHEN, Instructor in Elocution.
————— —————, Lecturer on Botany.
PROF. NEVIL N. EVANS, M.A.Sc., Lecturer on Chemistry.
MR. JAMES WALKER, Instructor in Penmanship and Book-keeping.
MISS LOUISE DERICK, Instructor in Kindergarten Methods.
MR. E. W. ARTHY, Lecturer in the Theory of Kindergarten and Transition Work.
MISS JESSIE Y. CHISHOLM, Instructor in Kindergarten History and Principles.
MISS V. M. HOLMSTROM, Instructor in Calisthenics.
J. A. WILLIAMS, M.D., Lecturer on Physiology and Hygiene.
H. L. BARNES, D.Sc., Lecturer on Physics.
MR. CARL JOHANSSON, Director of Manual Training, McDonald Endowment.
MR. G. E. EMBERLEY, Teacher of Manual Training.
MISS CATHERINE A. FRENCH, Instructor in Cooking.
MISS MATILDA CARDEN, Principal's Secretary and Librarian.

Model Schools of the McGill Normal School.

E. MONTGOMERY CAMPBELL, B.A., Head Master of Boys' School.
MISS MARY I. PEEBLES, Head Mistress of Girls' School.
MISS SELINA F. SLOAN, Head Mistress of Primary School.

Announcement for the Session, 1902-1903.

This Institution is intended to give a thorough training to teachers, by instruction and training in the Normal School itself and by practice in the Model Schools; and the arrangements are of such a character as to afford the greatest possible facilities to students from all parts of the province. The Protestant Central Board of Examiners for the Province of Quebec grants diplomas only to teachers-in-training of this Institution and to graduates of British or Canadian Universities.

The forty-seventh session of this School will commence on the second of September, 1902, and close on the twenty-ninth of May, 1903. The students are graded as follows :—

1. *Elementary Class*..—Studying for the Elementary Diploma.
2.—*Advanced Elementary Class.*—Studying for the Advanced Elementary Diploma.
3.—*Kindergarten Class.*—Studying for the Kindergarten Diploma.
4.—*Model School Class.*—Studying for the Model School Diploma.
5.—*Class in Pedagogy.*—Preparing for the Academy Diploma.

Detailed information respecting the courses of the four grades first enumerated above may be obtained on application to the Principal of the School, at 32 Belmont St., Montreal.

Academy Diplomas to Graduates.

All holders of model school diplomas that have been granted by the McGill Normal School or that shall hereafter be granted by the Central Board of Examiners shall be entitled to receive academy diplomas on graduating in Arts at some Canadian or other British university, provided that they pass in mathematics, Latin, Greek and French at the degree examinations, or failing this in any subject or subjects, pass in such subject or subjects examinations that are certified by the universities to give to the graduate concerned a standing not lower than that of second class at the close of the second year in arts. But graduates who substitute German for Greek, on fulfilling all other conditions, may receive modified Academy diplomas, which will not authorize the holders to become principals of Academies.

All graduates in arts of Canadian or other British universities who have passed in mathematics, Latin, Greek and French as above defined and have taken a course and have

passed satisfactory examinations in education and in practical teaching under the control of the universities or of the McGill Normal School as approved by the Protestant Committee of the Council of Public Instruction, shall be entitled to receive academy diplomas. The Central Board of Examiners shall determine who have passed satisfactory examinations in education and in practical teaching in view of the results, which, including examination questions and answers, shall be remitted to the Board by the university examiners, and in view of the recommendations of the professors of education. The Central Board of Examiners is empowered to set one-half of the questions in education, and to prescribe tests of ability to teach and to govern, which must be followed in such examinations.

To meet the requirements of graduates and undergraduates in Arts, who, not having previously taken a Normal School course, desire to receive Academy diplomas, and until the Universities themselves undertake the work, provision has been made for the delivery of a course of lectures on pedagogy in the Normal School and for practice in teaching in the McGill Model School for fifty half days, open to graduates in arts of any British or Canadian University, to undergraduates of the third year, and with the permission of the Faculty and the concurrence of the Principal of the Normal School, to those of the fourth year. The hours assigned for these lectures are from 3 to 4 p.m. on each Tuesday and Friday on which lectures are given in the Faculty of Arts. An examination on this course of lectures is held annually on the 20th day of May, or on the school day next succeeding that date; the hours are from 10 a.m. to 12 noon.

Undergraduates will be permitted to teach the fifty half days referred to above, during the months of December and May of the third and fourth years of their college course. Graduates will be permitted to teach in the Model Schools at such times as may be agreed on with the Principal. Those who teach in the Model Schools are expected to prepare all lessons and discharge all duties assigned them with faithful-

ness. Failure to teach or to govern in the Model Schools, as indicated by the percentage of marks taken, no less than failure to pass the examination on the course of lectures, endangers the academy diploma.

Each person desiring to take this course of study in the Normal School must make application for permission to enter to the Secretary of the Central Board of Examiners, on the authorized form, remitting to him at the same time all necessary certificates of standing and character, and a fee of $4.00. While in attendance on this course each person is subject to the regulations of the said school, and is under the supervision and control of its Principal.

University Examinations.

SESSION 1900-1901.

Faculty of Law.

PASSED FOR THE DEGREE OF B.C.L.

(In order of merit).

Place, E. G., B.A.
Campbell, G. A., B.A.
McMichael, R. C.
Thompson, J. R., B.A.
Rowat, D. M., B.A.
Doak, A. E.
McMaster, A. R., B.A.
Holden, A. R., B.A., B.Sc.
Moffat, D. S., B.A.
Mann, J. A.
Skinner, W. M.
Mitchell, W. G.
Kay, W. F.
Westover, E. W.
Springle, H. A.
Beique, F.
Barlow, J. C.

Faculty of Arts.

PASSED FOR THE DEGREE OF B.A.

IN HONOURS.

(In Alphabetical Order).

First Rank. — BARRINGTON, F. H.
BENNETT, C. W.
COPEMAN, JOS. H.
MCNAUGHTON, W. G.
MITCHELL, SYDNEY.
PAGE, HARRIET A.
SCRIMGER, F. A. C.
TEES, FRED. J.
WILLIAMS, H. S.

Second Rank.—CHIPMAN, W. F.
FLINT, MARY.
MCLEOD, ANGUS B.

ORDINARY B.A.

(In order of merit).

Class I.—Dickson, Norval (Special Certificate).
Harper, Robt. J. (Special Certificate).
Cotton, Wm. U. (Special Certificate).
Smith, E. M. (Special Certificate).
McDonald, John ‡
Lochead, A. W. ‡

Class II.—Fuller, Geo. D.
Hickson, Robt. D.
Moffatt, Chs. F.
Molson, Percival.
Charters, H.

Class III.—Scott, G. W.
Huxtable, G. M.
Lindsay, J. E.
Viner, Norman.
Stephens, L. de K.
Jeakins, Chs. E.
Mowatt, Joseph A.
McMurtry, S. O.
Millar, W. K. (Special Examination).
Reford, Louis (Special Examination).

STUDENTS REGISTERED IN THE FACULTY OF APPLIED SCIENCE PROCEEDING TO THE DEGREE OF B.A. IN COURSE.

McMurtry, G. O.
Scott, H. E.

STUDENTS REGISTERED IN THE FACULTY OF MEDICINE PROCEEDING TO THE DEGREE OF B.A. IN COURSE.

Horsfall, F. L.
McEwan, J. R.
McPherson, T.
Mitchell, I.
Strong, N. W.

ADMITTED TO THE DEGREE OF B.SC.

Steeves, Herbert Bliss.

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‡ *Special Course.*

BACHELORS OF ARTS PROCEEDING TO THE DEGREE OF M.A. IN COURSE.

Watson, Rosalind, B.A. (*in absentia*).
Seifert, Ethel M., B.A.
Brooks, Harriet, B.A.
McClung, R. K., B.A.

BACHELORS OF ARTS PROCEEDING TO THE DEGREE OF M.SC. IN COURSE.

Newson, Wm. V.

BACHELOR OF ARTS ADMITTED "AD EUNDEM GRADUM."

Fyshe, James C., B.A. (Harvard).

PASSED THE INTERMEDIATE EXAMINATION.

(1)—FOR COURSE LEADING TO B.A.

(In order of merit. Students of equal standing are bracketed together).

Class I.—Bovey, F. H. W.
Lomer, G. R. / Parkin, Maude.
Lundie, E. H.
Wisdom, K. F.
Belyea, M. E.
Harris, A. D.

Class II.—East, E. M.
Healy, W. J. / McMorran, T. T. / Wales, J. G.
Davidson, M. B. / Hadrill, M. F. / Seaman, J. C.
Couture, G. C. / Angus, J. M.
Joseph, H. F.
Lunny, Ry.
Fee, J. E.
McKay, E. B.
Parkins, E. R.

Class III.—Hanington, J. W.
Pownall, E. W.
Troop, G. W. H.
Pattison, A. M.
Cameron, D. / Dutaud, C.

Class III.—Fripp, G. D. (*s*)
Johnson, W. (*s*)
May, W. H. (*s*)
Mowatt, E. E. (*s*)
Simister, W. (*s*)

(2)—FOR COURSE LEADING TO B.SC.

Class II.—Gass, H.
McLeish, John.
Dunlop, Alan (*s*)
McLeod, E. (*s*)

SUPPLEMENTAL EXAMINATIONS.

September, 1901, to *February, 1902.*

PASSED FOR THE DEGREE OF B.A.

Brown, A. V.
Scott, W. J.
White, D. R.

Faculty of Applied Science.

PASSED FOR THE DEGREE OF BACHELOR OF SCIENCE.

(In order of merit).

CIVIL ENGINEERING.

Clement, Sheldon Bryne, Kingsville, Ont.
Blanchard, Arthur Clarence Douglas, Windsor, N.S.
McConkey, Walter Ross, Guelph, Ont.
Gagnon, Edmund Ernest, Westmount, Que.
Anderson, Thomas Victor, Ottawa, Ont.
Patterson, Frank Elliott, Almonte, Ont.

ELECTRICAL ENGINEERING.

McLaren, John Harold, Montreal, Que.
Burson, Herbert Arthur, St. Catharines, Ont.
Glassco, Archie Patrick Stinson, Hamilton, Ont.
Taylor, Charles William, Richwood, Ont.
Howard, Rupert Fortescue, Lachine, Que.
Walker, Frank Wilkes (B.Sc.), Montreal, Que.
Coussirat, Henri Alfred, Montreal, Que.
Neville, Thomas Patrick Joseph, (B.Sc.), Halifax, N.S.
Wenger, Edgar Isaac (B.A.Sc.), Ayrton, Ont.

s. With supplemental in one subject arranged alphabetically.

Sise, Paul Fleetford, Montreal, Que.
Ward, Percy Walton, Lachine, Que.
Lloyd, Herbert Mostyn, New Westminster, B.C
Scott, Henry Maurice, Montreal, Que.

MECHANICAL ENGINEERING.

Schwitzer, Thomas Henry, Ottawa, Ont.
Burwell, Ernest Victor, London, Ont.
Hampson, Edward Greville, Montreal, Que.
Cameron, Hugh Donald, Montreal, Que.
Lowden, Warden King, Montreal, Que.
Wilson, Reginald Clarence, Cumberland, Ont.

MINING ENGINEERING.

Edwards, William Muir, Ottawa, Ont.
Ritchie, Joseph Norman, Halifax, N.S.
Fraser, Donald Cameron, New Glasgow, N.S.
Frechette, Howells, Ottawa, Ont.
Archer, Augustus Rowley, New York, U.S.A.
Tupper, Charles, Vancouver, B.C.
Palmer, Ernest Edward, Toronto, Ont.
White, Gerald Verner, Pembroke, Ont.
Galbraith, Malcolm Thomas, Montreal, Que.
Ogilvie, Paul, Cummings' Bridge, Ottawa.
Flint, William George, Montreal, Que.
Donaldson, Hugh Walter, Hamilton, Ont.
McKenzie, Bertram Stuart (B.A.), London, Ont.

PRACTICAL CHEMISTRY.

Paterson, Charles Stiven, Montreal, Que.
DcBlois, William Howard, Halifax, N.S.

MECHANICAL ENGINEERING.

Sise, Paul Fleetford, Montreal, Que.

ADMITTED TO THE DEGREE OF MASTER OF SCIENCE.

(In Course.)

Allen, Samuel James, B.Sc., Maitland, N.S.
Childs, Arthur Edward, B.A.Sc., Boston, Mass., U.S.A.
Colpitts, Walter William, B.Sc., Moncton N.B. (*in absentia*).
Cornwall, Clement Arthur Kingscote, Ashcroft, B.C. (*in absentia*).
Duncan, Gailen Rupert, B.A.Sc., Montreal, Que.
Fraser, James William, B.Sc., Bridgeville, N.S.
Glassco, Jack Girdlestone, B.Sc., Hamilton, Ont.
Grier, Arthur Gordon, B.Sc., Montreal, Que.
Young, George Albert, B.A.Sc., Kingston, Ont.
Butler, Percy, B.Sc., Perth Amboy, N.J. (*in absentia*).

ADMITTED TO THE DEGREE OF DOCTOR OF SCIENCE.

(In Course.)

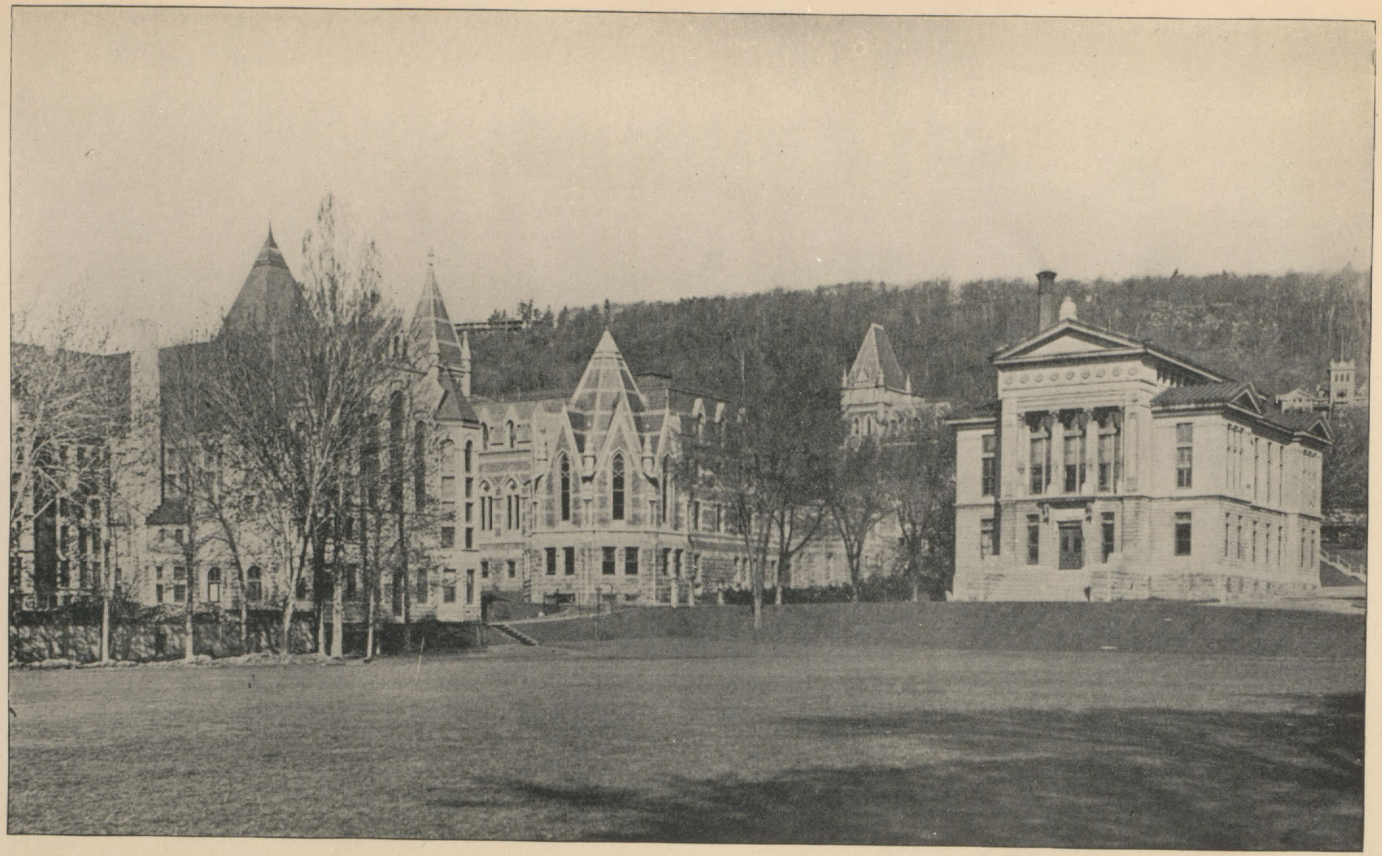
Bell, Robert, B.A.Sc., M.D., F.R.S., Ottawa, Ont.

Faculty of Medicine.

PASSED FOR THE DEGREES OF DOCTOR OF MEDICINE AND MASTER OF SURGERY.

Bayfield, T. F., Charlottetown, P.E.I.
Belanger, E. R., Ottawa, Ont.
Blake, J. J., Charlottetown, P.E.I.
Browne, J. G., B.A., Montreal, Que.
Bruce, J., B.A., Moncton, N.B.
Butler, P. E., Milltown, N.B.
Campbell, R. P., B.A., Westmount, Que.
Carlyle, D. A., Morewood, Ont.
Cartwright, C., Kingston, Ont.
Coates, H. W., Bass River, N.B.
Collison, H. McN., Dixon's Corners, Ont.
Collison, J., Dixon's Corners, Ont.
Crang, F. W., Toronto, Ont.
Dalton, C. H., Tignish, P.E.I.
Donaldson, A. S., Brockville, Ont.
Duncan, J. W., Montreal, Que.
Egan, W. J., Sydney Mines, N.S.
Ellis, R. L., Youghall, N.B.
Fleming, J. E., North Rustico, P.E.I.
Fuller, A. T., B.A., Truro, N.S.
Gardner, R. L., B.A., Brockville, Ont.
George, J. D., Redwood, N.Y., U.S.A.
Goodall, J. R., B.A., Ottawa, Ont.
Harley, R. J. O., Cheshire, Eng.
Hope, J. T., Glen Robertson, Ont.
Howard, A. C. P., B.A., Montreal, Que.
Hunter, E. N. McL., Merrimac, Mass., U.S.A.
Jackson, G. F., Brockville, Ont.
Johnson, R. DeL., B.A., Montreal, Que.
Johnston, A., Leeds, Que.
Johnston, J. L., Martintown, Ont.
Jones, J. H., Brockville, Ont.
Jones, Sydney, B.A., Cleveland, Ohio, U.S.A.
Kendall, A. L., Vancouver, B.C.

Ker, R. H., B.A., Montreal, Que.
Lawlor, F. E., Dartmouth, N.S.
Learmonth, G. E., B.A., Westmount, Que.
Leggett, T. H., Ottawa, Ont.
Little, H. M., B.A., London, Ont.
Lunney, T. H., St. John, N.B.
Mackay, D. S., Reserve Mines, N.S.
Mackay, M., B.A., Montreal, Que.
Mackenzie, S. D., Sarnia, Ont.
Macneil, J. W. L., Kensington, P.E.I.
Macpherson, C., St. John's, Nfld.
McDonald, C. A., Milltown, N.B.
McDonald, E. E., Fort Qu'Appelle, N.W.T.
Martin, E. A., Kemptville, Ont.
Meighen, W. A., Perth, Ont.
Millar, S., South Dunham, Que.
Miller, G. H. S., Alexandria, Ont.
Moore, J. C., D.V.S., St. Chrysostome, Que.
Morgan, A. D., Nanaimo, B.C.
Mullaly, E. J., Souris, P.E.I.
Newcombe, W. E., Vancouver, B.C.
Niven, J. K., London, Ont.
O'Sullivan, M. T., Glace Bay, C.B.
Paterson, A., B.A., Montreal, Que.
Penner, E., B.A., Gretna, Man.
Pittis, H., Plainfield, N.J., U.S.A.
Redon, L. H., B.A., Victoria, B.C.
Richards, B. A., Yarmouth, N.S.
Roberts, J., Hamilton, Ont.
Robertson, C. G., Hawkesbury, Ont.
Robertson, L. F., B.A., Stratford, Ont.
Robertson, R. D., St. John, N.B.
Robidoux, L. E., B.A., Shediac, N.B.
Rogers, H. B., Peterboro, Ont.
Russel, C. K., B.A., Montreal, Que.
Russell, E. M., Springfield, Mass., U.S.A.
Rutherford, C. A., Waddington, N.Y., U.S.A.
Ryan, W. T., B.A., Fredericton, N.B.
Sanders, C. W., Kemptville, Ont.
Shearer, C., Montreal, Que.
Shearer, R. L., Kelso, Que.
Simpson, A. S., Bay View, P.E.I.
Simpson, E. G. W., B.A., Lennoxville, Que.
Snyder, A. E. W., Coaticooke, Que.



The Museum from the Campus.

Stentaford, G. L., Heart's Content, Nfld.
Stevenson, J., B.A., Montreal, Que.
Stewart, C. J., Russell, Ont.
Stewart, C. A., Dunvegan, Ont.
Taylor, D. A., Havelock, N.B.
Taylor, W. L., Waterloo, Que.
Ward, J. A., Lewiston, Maine, U.S.A.
White, E. H., B.A., Montreal, Que.
Wiggin, W. I., Lowell, Mass., U.S.A.
Wiley, B. E., Fredericton, N.B.
Williams, W., Remsen, N.Y., U.S.A.
Wilmot, LeB. B., Oromocto, N.B.
Wilson, J. J., Montreal, Que.
Winter, D. E., Montreal, Que.
Wyman, H. B., B.A., Chute a Blondeau, Ont.

GRADUATES IN MEDICINE QUALIFIED FOR THE DIPLOMA IN LEGAL MEDICINE.

Collison, H. McN.
Collison, J.
Egan, W. J.
Hope, J. T.
Hunter, E. N. McL.
Johnston, J. A.
Kendall, A. L.
Little, H. M., B.A.
Lunney, T. H.
O'Sullivan, M. T.
Robertson, C. G.
Stewart, C. J.
Wiggin, W. I.
Williams, W.
Wilson, J. J.

Faculty of Comparative Medicine and Veterinary Science.

PASSED FOR THE DEGREE OF D.V.S.

O. T. Amyrauld. J. T. Rork. D. S. Tamblyn.

Students of the University.

SESSION 1901-1902.

McGILL COLLEGE.

Faculty of Law.

FIRST YEAR.

Brodie, Hugh H., Westmount, Q.
Brosseau, Bernard L., Montreal.
Chipman, Warwick F., Montreal.
Cotton, Wm. Ulric, B.A., Sweetsburg, Q.
DeWitt, Jacob, B.A., Montreal.
Dickson, Norval, Allans Corners, Q.
Drouin, Joseph, Montreal.
Freidlander, Abraham, Montreal.
Ker, Thomas R., Montreal.
McDougall, Malcolm E., Mattawa, Ont.
McGregor, James A., Huntingdon, Q.
Mackie, Henry A., Cookshire, Q.
Ogilvie, William Prescott, Montreal.
Phelan, M. A., Montreal.
Pope, Charles Alex., Quebec, Q.
Stephens, L. DeK., Montreal.
Tanner, Agenor Henry, Joliette, Q.
Vineberg, Abraham Halmer, Montreal.
Wadleigh, Wilfred William, Kingsay, Q.
Whelan, Michael Arthur, Montreal.
Williams, Henry Stevens, B.A., Knowlton, Q.

SECOND YEAR.

Angus, David James, Montreal.
Bergeron, Patrick John, Stanstead, Q.
Blaylock, Harry W., Danville, Q.
Casgrain, Alex. Chase, Montreal.
DeLorimer, Jos. G. G. Montreal.
Gosselin, Louis, Notre Dame de Stanbridge, Q.
Madore, Louis, Montreal.
MacKinnon, Cecil Gordon, Cowansville, Q.
Orr, Henry Stanley, Cookshire, Q.
Rankin, Arthur G. Ernest, Montreal.
Rugg, Frederick S., Stanstead, Q.
Tansey, Thomas M., Montreal.
Theberge, Albert, St. Jerome, Q.
Weinfield (B.A.), Henry, Montreal.

THIRD YEAR.

Astle, Thomas Francis, Little Metis, Q.
Aylmer, Henry U. P., Richmond, Q.
Bonin, Alexander L., Montreal.

Brown, Ernest N., Lachine.
Cotton, Charles Mackay, Sweetsburg, Q.
Couper, William Mason, Montreal South.
Draper, Dennis C., Sutton Jct., Q.
Duff, Alexander Huntley, Montreal.
Gariépy, Wilfrid, Edmondton, Alba.
Ogden, Charles G., Three Rivers, Q.
Staveley, Wm. R., Montreal.
Wainwright, Arnold, Montreal.

Faculty of Medicine.

FIRST YEAR.

Alguire, A. R., Cornwall, Ont.
Auld, J. W., Vancouver, B.C.
Bonelli, V., B.A., Ste. Agathe des Monts, Q.
Brown, F. F., Cornwall, Ont.
Brown, G. T., Danville, Q.
*Budyk, J. S., Montreal.
Bulmer, A. M., Montreal.
Burgess, H. C., Sheffield Mills, N.S.
Cameron, A. B., Lancaster, Ont.
*Chandler, A. B., Montreal.
Chisholm, H. A., Linwood, N.S.
Connor, E. L., Berlin, Ont.
Conway, C. J., B.A., Millville, Mass., U.S.A.
Costello, W. J., B.A., Montreal.
Covernton, C. F., Montreal.
Cumming, A., B.A., Scotsburn, N.S.
*Curtis, W. E., Montreal.
*Dearborn, H. F., Lawrence, Mass., U.S.A.
Des Isles, C. J. R., Montreal.
Dougan, B. H., Hibernia, N.B.
Dowler, W. H., Billings Bridge, Ont.
Duggan, R. G., Hamilton, Ont.
Dykes, W., Nanaimo, B.C.
Eaton, F. C., Hancock, N.H., U.S.A.
Ewart, D., Billings Bridge, Ont.
Finigan, J. F., Oshawa, Ont.
*Fripp, G. D., Montreal.
Gaudet, E. A., Memramcook, N.B.
†Gourley, H. B., Ph.B., Montreal.
Grant, D. J., Gravenhurst, Ont.
*Gray, E. H., Montreal West, Q.
Greene, H. B., Lyndhurst, Q.
Grimmer, R. D., St. Andrews, N.B.
Gunn, A. K., Lancaster, Ont.
*Gurd, F. B., Montreal.
Hand, W. T., Montreal.
Hanington, D. P., Victoria, B.C.
Hanington, J. W. B., Victoria, B.C.
Heagerty, J. J., Montreal.
Henderson, E. H., B.A., Franklin Centre, Q.
Henry, E. G., B.A., Lennoxville.
Hewitt, T. J., Montreal.
Hume, G. M., Leeds, Q.
Joughin, J. L., Moncton, N.B.
King, F. C., Wolfville, N.S.
King, J. L., Montreal.

* *Double Course.* † *Partial.*

King, S. S., Albert, N.B.
Leslie, H. A., Souris West, P.E.I.
Likely, D. S., B.A., St. John, N.B.
Loggie, W. S., Chatham, N.B.
*Lomer, S. A., Montreal.
MacDermot, J. H., Gordon Town, Jamaica.
†MacDonald, J. P., Ste. Agathe des Monts, Q.
MacGillis, A. F., Bridge End, Ont.
MacLean, J. D., Culloden, P.E.I.
McCormick, A. S., Montreal.
*McDonald, J. A., Valleyfield, Q.
McDougald, W. L., Cornwall, Ont.
McIntosh, G. J., Dalkeith, Ont.
McMurtry, S. O., B.A., Port Hope, Ont.
McMurtry, W. C., Montreal.
McNaughton, W. B., St. Raphael West, Ont.
Mason, J. H., Lachute Mills, Q.
*Mercer, T. C., Chilliwack, B.C.
Mersereau, H. C., Doaktown, N.B.
Moffatt, C. F., B.A., Montreal.
Mohr, F. W. C., Arnprior, Ont.
Morrison, J. C., Vancouver, B.C.
Muckleston, H. S., M.A., Perth, Ont.
Mulligan, J. W., Omemee, Ont.
Nelles, S. R. B., Simcoe, Ont.
Petersky, S., Vancouver, B.C.
Prendergast, A. R., B.A., Montreal.
*Pruyn, W. G., Napanee, Ont.
*Rabinovitch, M., Montreal.
Ralph, A. J., Ph.B., Montreal.
Raftery, C. R., Montreal.
Richards, E. T. F., St. Vincent, B.W.I.
Robertson, A. R., Victoria, B.C.
Robertson, B. W., Wickham, N.B.
Rommel, E., Alma, N.B.
Ryan, F. McD., B.A., Camden East, Ont.
Sawyer, A. R., Roslindale, Mass., U.S.A.
Scott, W. J., B.A., Montreal.
Scrimger, F. A. C., B.A., Montreal.
†Ship, A. P., Montreal.
Shipley, C. E., East Amherst, N.S.
Sinclair, E. E., Summerside, P.E.I.
Soady, J. H., B.A., Nelson, B.C.
Somerville, H. A., Waterville, Q.
†Styles, W. A., Montreal.
Sullivan, J. A., Arnprior, Ont.
Tees, F. J., B.A., Halifax, N.S.
Tierney, J. E., Niagara Falls, N.Y.
Tull, J. A. C., Antigua, B.W.I.
Turnbull, E. G., Branchton, Ont.
Valin, R. E., Ottawa, Ont.
Viner, N., B.A., Montreal.
*Wales, H. Osgood, Robinson, Q.
Wilkinson, W. M., Woodstock, Ont.
Wood, G. O., Morrisburg, Ont.
Wotherspoon, H. C., St. Albans, Vt., U.S.A.
Wyman, J. K., Rockland, Ont.
Young, C. A., Ottawa, Ont.

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* *Double Course.* † *Partial.*

SECOND YEAR.

Ainley, L. T., B.A., Almonte, Ont.
Ainley, W. E., B.A., Bermuda, B.W.I.
Alford, H. J., Ottawa.
Atkinson, H. S., Cupids, Nfld.
Bentley, J. S., B.A., Truro, N.S.
Black, C., Oxford Station, Ont.
Blanchet, S. F. N., Ottawa.
Bonin, R. P., Montreal.
Bromley, J. E., Pembroke, Ont.
Charman, F. D., Wallace, N.S.
Chipman, W. W., Ottawa.
Coffin J. W., Mount Stewart, P.E.I.
Cook, W. J., Coboconk.
Crack, I. E., B.A., Kingsbury, Q.
Crosby, P. C., Marshfield, P.E.I.
Crowell, B. C., B.A., Yarmouth, N.S.
Cunningham, F. J., Montreal.
Dalton, J. T., St. John, N.B.
Davidson, H. D., Sherbrooke, Q.
Dillon, W. P., Iroquois, O.
Douglas, E. D., B.A., Halifax, N.S.
Dunn, J. F., Elgin, Ont.
Eaton, C. E., Stanbridge, Q.
Ernandez, J. A., Spanish Town, Jamaica.
Finnie, J. A., Montreal.
Faulkner, J. A., B.A., Stirling, Ont.
Fisher, E. M., Bluebonnets, Q.
Ford, H. S., Vancouver, B.C.
Ford, W. S., Belleville, Ont.
‡Fraser, S., Leeds, Q.
Fyshe, J. C., A.B., Montreal.
Geddes, R. W., B.A., Deseronto, Ont
Gibson, G. M., Huntingdon, N.Y.
Gibson, R., Nanaimo, B.C.
Gill, F. D. B., St. John's, Nfld.
Gillis, J. E., Darlington, P.E.I.
Gilroy, J. R., Springhill, N.S.
Gormely, J. C., Morrisburg, Ont.
Graham, R. W., Sawyerville, Q.
Grant, N. P., Woodstock, N.B.
Greenwood, W. T., St. Catharines, Ont.
Harrison, L. L., B.A., Maccan, N.S.
Hogan, F. J., North Cape, P.E.I.
Hotchkiss, E. A., Collinsville, Conn.
Howitt, H. O., Guelph, Ont.
Hughton, M., Arnprior, Ont.
Hunter, J. D., Victoria, B.C.
Inksetter, F. S., Dundas, Ont.
Johnson, J. G. W., B.A., Montreal.
Judson, A. H., Lynn, Ont.
Keys, M. J., Hulbert, Ont.
Lacasse, L. J., Campbellton, N.B.
Lauchland, L. C., B.A., Oshawa, Ont.
Lawson, G. E., Grand Manan, P.E.I.
Lincoln, W. A., Stanstead, Q.
Lippiatt, H. T., Abbotsford, Q.
Losier, A. J., Tracadie, N.B.
MacCallum, J. D. G., Montreal.

‡ *Conditioned.*

Mackenzie, A. B., Springfield, P.E.I.
Mackid, L. S., Calgary, Alta.
McDonald, J. C., Peak's Station, P.E.I.
McIntosh, L. de C., Iroquois, Ont.
McKenty, F., Bath, Ont.
McKenzie, R. P., Plainfield, Ont.
McLachlan, D. C., Lochabar Bay, Q.
McLeod, J. A., Dunvegan, Ont.
McLeod, W. A., Finch, Ont.
McMicking, A. E. T., Victoria, B.C.
Maillet, H. A., Butte City, Montana, U.S.A.
Margolese, O., Montreal.
Markson, S., Glen Robertson, Ont.
Martin, J. C., Whitechurch, Ont.
Meakins, J. C., Hamilton, Ont.
Miller, C., Stellarton, N.S.
Miller, V. L., B.A., Bear River, N.S.
Muir, K. C., Huntingdon, Q.
*Murphy, H. H., Antrim, Ont.
Nagle, S. M., Almonte, Ont.
Nathan, D., Montreal.
Nutter, J. A., B.A., Montreal.
Pavey, C. A., London, Ont.
Preston, C. E., Ottawa.
Price, J., Verdun, Q.
Quain, B. P., Moira, N.Y.
Rankin, A. C., Montreal.
Reford, L. L., B.A., Montreal.
Richardson, C. A., Jefferson, Maine, U.S.A.
Richardson, C. A. C., B.A., Sydney, C.B.
Rilance, C. D., Lachine, Q.
Robinson, J. L., St. Marys, Ont.
Rogers, J. T., B.A., Montreal.
Seifert, F. W., B.A., Quebec, Q.
Sellery, A. C., Kincardine, Ont.
Shillington, R. N. W., Ottawa.
Sibbald, J. P. M., Sutton West, Ont.
Sims, H. A., Montreal.
Smith, W. A., B.A., Almonte, Ont.
Stewart, J. A., Norboro, P.E.I.
Sweeney, J. L., B.A., Dover, N.H., U.S.A.
Warwick, W., St. John, N.B.
Waterman, C., Ogdensburg, N.Y.
Wigle, C. A., Wiarton, Ont.
Wilson, C. E., Napanee, Ont.
Wilson, O. M., Smiths Falls, Ont.
Wilson, T. R., B.A., Carp, Ont.
Winfrey, W. W., B.L., Sault Ste. Marie, Michigan.
Wood, H. G., Faribault, Minn.
Wood, W. H., Westmount, Q.
Wright, G. A., Stony Creek, N.B.
Yorston, F. P., Newcastle, N.B.
Young, G. J., St. Margaret's Bay, N.S.

THIRD YEAR.

Allan, R. H., Montreal.
Allum, A. W., Renfrew, Ont.
Anderson, C. W., B.A., Halifax, N.S.
Andrews, J. J., St. Lambert, Q.

* *Double Course.*

Anton, D. L. S., Ireland.
Arnold, D. R., B.A., St. John, N.B.
Auston, J. B., Brighton, Ont.
Bailey, G. W., Fredericton, N.B.
Bishop, G. A., Kinburn, Ont.
Bishop, L. C., Marbleton, Q.
Blakeman, F. W., Stratford, Ont.
Boire, W. E., Manchester, N.H., U.S.A.
Boulter, J. H., Picton, Ont.
Boyd, O., Russell, Ont.
Briggs, J. A., New Westminster, B.C.
Brooks, J. E., B.A., Eastport, Maine, U.S.A.
Burns, A. S., B.A., Kingston Station, N.S.
Campbell, W. G., Brantford, Ont.
Carnochan, W. L. C., Montreal.
Chamberlain, H. B., Perth, Ont.
Chandler, E. C., Montreal.
Chaplin, H. L. S., St. John's, Nfld.
Church, H. C., Chelsea, Q.
Cowperthwaite, H. H., St. John's, Nfld.
Croft, L. V., B.A., Middleville, Ont.
Cumming, W. G., B.A., Montreal.
Dickson, A. J., B.A., Goderich, Ont.
Dickson, W. H., Pembroke, Ont.
Donnelly, William H., Ogdensburg, N.Y.
Douglas, F. C., Montreal.
Dowson, C. K., Montreal.
Doyle, F. H., B.A., Natick, Mass., U.S.A.
Ebbett, L. P. B., Lower Gagetown, N.B.
Elder, R., Trout River, Q.
Ells, R. H., B.A., Ottawa.
English, J. M., New Westminster, B.C.
Fisher, F., B.A., Bay of Islands, Nfld.
Forbes, R. D., Stratford, Ont.
Fortin, C. E. F., B.A., Winnipeg, Man.
Freeze, E. H., Penobsquis, N.B.
Frost, A. C., Montreal.
Gale, W. P., Quebec, Q.
Gillis, J. H., Campbellton, N.B.
Gilmour, C. R., Brockville, Ont.
Gow, R. J., Warkworth, Ont.
Hansen, N. C., M.A., Portland, Maine, U.S.A.
Hardisty, R. H. M., Montreal.
Horsfall, F. L., Montreal.
Hutchinson, J. W., Montreal.
Hynes, W. T., Darnley, P.E.I.
Kenny, R. W., Ottawa.
Kerr, H. H., Washington, D.C., U.S.A.
King, R., B.A., Sackville, N.B.
Kissane, J. W., Chateaugay, N.Y., U.S.A.
Lamb, W. V., St. Andrews, N.B.
Langsford, A. W., Cameron, Ont.
Laurie, E., B.A., Montreal.
Lundie, J. A., B.A., Montreal.
Lyman, W. S., Knoxville, Tenn., U.S.A.
Lynch, A. L., Britannia Bay, Ont.
Macdonald, R. St. J., B.A., Bailey's Brook, N.S.
Mackenzie, W. A., Wood Islands, P.E.I.
McCulloch, J. M., Durham, Ont.
McDiarmid, C. A., Kemptville, Ont.
McDonald, S. H., B.A., St. John, N.B.
McEachern. I. W. T., Rockland, Ont.

McEwen, J. R., Dewettsville, Q.
McGrath, F. C., Norway, P.E.I.
McGuigon, J. D., Kelly's Cross, P.E.I.
McIntosh, H. H., Montreal.
McIntosh, J. A., Vankleek Hill, Ont.
McKechnie, D. W., Dundas, Ont.
McLaren, D. D., Felton, Ont.
McLaughlin, E. M., Winona, Minn., U.S.A.
McPherson, T., Stratford, Ont.
Maby, W. J., Cohoes, N.Y., U.S.A.
Magee, C. F., North Gore, Ont.
Meindl, A. G., Mattawa, Ont.
Mitchell, J. E., B.A., Sherbrooke, Q.
Montgomery, C. H., St. John, N.B.
Morris, S. C., Wallace, N.S.
Munro, J. H., Maxville, Ont.
Munroe, H. B., B.A., Almonte, Ont.
Munroe, H. E., St. Elmo, Ont.
Murray, J. S., St. John, N.B.
Nelson, J. S., City View, Ont.
Nelson, W. E., Montreal.
Ness, W., Howick, Q.
O'Brien, C. W., B.A., Noel, N.S.
O'Neill, J. M., Messina, N.Y., U.S.A.
Park, A. W., Durham, Ont.
Parris, N. D., Barbadoes, W.I.
Patch, F. S., B.A., Montreal.
Peterson, G. R., Toy's Hill, Ont.
Puddington, B. A., St. John, N.B.
Rehfuss, W. N., Bridgewater, N.S.
Robertson, W. G., Montreal.
Scott, W., Montreal.
Secord, H. W., Brantford, Ont.
Slack, M. R., Farnham, Q.
Smith, C. M., Red Mountain, Q.
Steeves, E. O., Upper Sackville, N.B.
Stowell, F. E., Worcester, Mass., U.S.A.
Taggart, E. A., Ottawa.
Tanner, C. A. H., Windsor Mills, Q.
Thomas, S. B., Bridgetown, Barbadoes, W.I.
Townsley, R. H., Westmount, Q.
Truax, W., Farnham, Q.
Turner, G. H., B.A., Baie Verte, N.B.
White, P. G., Woodstock, Ont.
White, S. G., Ottawa.
Willmore, J. G., London, England.
Wilson, A., Russell, Ont.

FOURTH YEAR.

Ames, A. C., Field, B.C.
Anthony, T. B., Berwick, N.S.
Baillie, S. A., B.A., Troy, N.Y., U.S.A.
Bishop, L. C., Marbleton, Q.
Blair, H. G. F., Ashton, Ont.
Byers, J. R., Montreal.
Campbell, A., Souris, P.E.I.
Campbell, J. A. E., B.A., Westmount, Q.
Cantlie, F. P. L., Montreal.
Carter, W. LeM., B.A., Quebec, Q.
Christie, F. J., Martintown, Ont.
Codrington, R. F., Montreal.

Colby, J. C., B.A., Stanstead, Q.
Coleman, C. E., Chatham, N.B.
Cox, R. B., Collinsville, Conn., U.S.A.
Cullen, W. H., Montreal.
Curren, L. M., St. John, N.B.
Currie, W. D., B.A., Halifax, N.S.
Dixon, J. D., Montreal.
Dixon, W. E., Montreal.
Dorion, W. A., Waterloo, Q.
Eastman, E. B., Portsmouth, N.H., U.S.A.
Evans, S., Ottawa.
Featherston, H. C., Hamilton, Ont.
Folkins, H. G., Millstream, N.B.
Forster, J. F. C., Dorchester, N.B.
Gardiner, R. J., Smith's Falls, Ont.
Gardner, W. A., B.A., Huntingdon, Q.
Gibson, E. J., Campbellford, Ont.
Green, F. W., Pictou, N.S.
Halliday, J. Le R., Sawyerville, Q.
Harris, L. C., Moncton, N.B.
Hart, F. W., B.A., Sackville, N.B.
Harvie, S. K., B.A., Newport, N.S.
Henry, C. M., Palmer, S. Dakota, U.S.A.
Hollingsworth, J. E., Meekling, S. Dakota, U.S.A.
Hopkins, C. W., Arcostook Junc., N.B.
Hyatt, E. A., B.Sc., Dickinson's Centre, N.Y.
Igoe, O. A., Tarrytown, N.Y.
Irwin, F., Shelburne, N.S.
Johnson, G. R., B.A., Annapolis, N.S.
Johnson, J. A., B.A., Lachine, Q.
Jones, N. C., B.A., Gananoque, Ont.
Leney, J. M., B.A., Montreal.
Lidstone, A. E., Richmond West, Ont.
Lomas, A. J., Montreal.
Macdonald, A. A., B.A., St. Andrews, P.E.I.
Mackinnon, G. E. L., Alexandria, Ont.
Mackinnon, I. W., Charlottetown, P.E.I.
MacLaren, A. H., B.A., Huntingdon, Q.
MacNaughton, J. A., Salsbury, N.B.
McDonald, P. A., B.A., Dundee Centre, Q.
McGibbon, D., Arkona, Ont.
McGibbon, S., Arkona, Ont.
McGrath, R. H., Dorchester, N.B.
McKee, W. E., Coaticooke, Q.
McKenzie, J. B., B.A., Campbellton, N.B.
McNeill, J. F., Kensington, P.E.I.
Manchester, J. W., St. John, N.B.
Martin, H. E., Chatham, Ont.
Mason, E. G., Westmount, Q.
Mason, F. C., Plattsburg, N.Y., U.S.A.
Mason, L. D., B.A., Montreal.
May, L. W., Ottawa.
Menzies, J. E., New Bedford, Mass.
Moffatt, G., Inkerman, Ont.
Morrison, J. F., Copleston, Ont.
Morse, W. R., B.A., Lawrencetown, N.S.
Moses, H. C., Caledonia, Ont.
Mothersill, G. S., Ottawa.
Palmer, G. H., Dorchester, N.B.
Paterson, R. C., B.A., Montreal.
Pavey, H. L., London, Ont.
Peters, O. R., Gagetown, N.B.

Pickard, L. N., Charlottetown, P.E.I.
Pratt, C. M., St. John, N.B.
Ritchie, C. F. P., B.A., Montreal.
Robb, G W. A., Oxford, N.S.
Roberts, A. B., Lanark, Ont.
Saunders, W. E., Woodstock, N.B.
Ship M. L., B.A., Montreal.
Smith, T. W., Hawkesbury, Ont.
Stockwell, H. K., Danville, Q.
Symmes, C. R., Aylmer.
Thomas, J. W., B.A., Montreal.
Tolmie, J. A., Moose Creek, Ont.
Tracy, E. A., B.A., Lancaster, N.H., U.S.A.
Van Wart, R. McL., B.A., Fredericton, N.B.
Walker, H., Jr., B.A., New York, U.S.A.
Wilkins, F. F., Montreal.
Williams, R. G., Meaford, Ont.
Wood, I. H. M., Montreal.

Faculty of Arts.

FIRST YEAR.

Adams, C. A., Huntingdon Acad., Franklin Centre, Q.
‡Baker, W. E., Congregational College, Cobourg, Ont.
Blanchard, C. H. S., Upper Canada Coll., Toronto, Winnipeg, Man.
Cameron, A. W. Montreal High School, Montreal.
‡Chodat, Henri
Cotton, Thos. F., Montreal High School, Cowansville, Que.
Cousineau, V. M., Ontario Public Schols and M. Dioc. T. Coll. Spragge, Ont.
Cross, C. Ernest, St. Francis Coll. Gram. School, Melbourne, Q.
Curtis, Walter E., Prince of Wales Coll., P.E.I., Milton, P.E.I.
Cushing, R. M., Montreal High School, Montreal.
Dawson, E. E., Lachute Acad., Stonefield, Q.
Dey, W. Fred., Simcoe High School, Simcoe, Ont.
Dunham, W. P., St. John, N.B., Public School and M. Dioc. T. Coll., St. John, N.B.
Edwards, L. F., Central High School, Grand Rapids, Grand Rapids, Mich., U.S.A.
Fraser, Geo. A., Montreal High School, Montreal.
Gibsone, L. F. Quebec High School, Quebec, Q.
†Gladman, C. R. A., Lindsay, Ont.
Greenshields, C. G. Bishops Coll. School, Lenn'le, Montreal.
†Halpenny, T. A., Bear Brook, Ont.
Hibbard, M. L., Dufferin Gram. School, Brigham, Q., Farnham. Q.
Howitt, Hy., Montreal High School, Guelph, Ont.
Hyde, G. Gordon, Montreal High School, Montreal.
Jenkins, Jos., Montreal High School, Montreal.
King, Louis V. Montreal High School, Montreal.
Locke, Ernest E., Westmount Academy, Westmount, Q.
McCuaig, Douglas R., Crichton School, Montreal.
McFee, M. C. C., Montreal High School, Montreal.
Macmillan, G. E., Prince of Wales Coll., New Haven, P.E.I.
McMurtry, R. O., Montreal High School, Montreal.
Macnab, Norman, Montreal High School, Montreal.
Manley, R. W., M. Dioc. Theol. Coll, Buckingham, Q.
‡Molson, H. W., Bishops Coll. School, Lennoxville, Q., Montreal.
Monk, Fred. A E., Ward Whate's School and McGill Coll., Montreal.

‡ *Conditioned.* † *Partial.*

Nicholson, Jno. C., Owen Sound, Lucknow, Ont.
Ower, Jno. Jas., Smith's Falls High School, Smith's Falls, Ont.
Perry, K. M., Regina High School, Regina, Assa.
Rabinovitch, M., Montreal High School, Montreal.
Robinson, F. G., Bishop's Coll. School, Lenn'le, St. John, N.B.
Robinson, W. W., Bishop's Coll. School, Lenn'le, Granby, Q.
Ross, Colin E., Westmount Acad., Westmount, Q.
Ross, Daniel, Montreal High School, Montreal.
Roy, Philias R., Feller Inst., Grande Ligne, Q., Sabrevois, Q.
Shearer, Jas. R., Ottawa Collegiate Institute, Sherbrooke, Q.
‡Stackhouse, R. T., Lochart's Academy, Lachute, Q.
Stewart, Thomas S., Crichton School, Montreal.
Stewart, Willie, Crichton School, Montreal.
Tannenbaum, D., High School, Montreal.
‡Thomson, J. W., Renfrew High School, Mattawa, Ont.
Tupper Chas. S., Upper Canada School, Private Tution, Winnipeg, Man.
Wales, Osgood H., Danville Acad., Robinson, Q.

SECOND YEAR.

Archibald, John G., Montreal.
†Argue, A. B., Stittsville, Ont.
(3) †Baker, Chris. W., Carlingford, Ont.
Brown, Wm. G., Montreal.
Budyk, J. S., Montreal.
Campbell, D. Grant, Montreal.
Chandler, Arthur B., Montreal.
Dearborn, H. T., Lawrence, Mass., U.S.A.
Dickenson, John D., Hazel Hill, N.S.
Emmerson, H. R., Dorchester, N.B.
French, Arthur, Montreal.
(3 B.Sc.) Gaunt, Reg. T., Montreal.
*Gray, Edwin H., Montreal West, Q.
Gurd. Fraser R., Montreal.
(1) †Halpenny, T. Anson, Bear Brook, Ont.
Harvie, Robt., Westmount, Q.
Hindley, J. Geo., Guelph, Ont.
†Hutchinson, James J., Craig's Holme, Ont.
Lathe, Frank E., Lacolle, Q.
Logan, David C., Montreal.
Lomer, Theodore A., Montreal.
Macaulay, Frederick R., Montreal.
MacFarlane, Charles McK., Aubrey, Q.
McCallum, Orick B., Montreal.
†McCutcheon, O. T., Leeds Village, Q.
McDiarmid, J. S., Ingersoll, Ont.
McDonald, George C., Montreal.
†McEachran, R., Glenarm, Ont.
McGougan, Ed., Glencoe, Ont.
McKenzie, Angus D. M., Hartsville, P.E.I.
†McKenzie, J. D., Montreal.
†McLellan, W. J., Massena, N.Y., U.S.A.
McMillen,, H. A. Alberry Plains, P.E.I.
Marshall, Wm. W., Montreal.
†Moech, L. C., Barb, Ont.
Mingie, Geo. W., Point St. Charles, Q.

* *Double Course.* † *Partial.* ‡ *Conditioned.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

Molson, Walter, Montreal.
†Ormiston, A., Columbus, Ont.
Papineau, Talbot M., Montreal.
Rose, Herbert J., Ottawa.
†Ross, Walter, Uptengrove, Ont.
Rubinowitz, I., Vancouver, B.C.
Shanks, George, Howick, Q.
†Sharpe, Jas. A., Clydesdale, Ont.
Sheldon, Ernest W., Westmount, Q.
Stewart, J. Ure., Goderich, Ont.
Thomson, George D., Montreal.
Walker, H. Earle, Westmount, Q.
Wickware, Francis G., Easton's Corners, Ont.
†Weir, D. G., Montreal.
‡Wright, Robert P., Montreal.

THIRD YEAR.

Ascah, R. G., Peninsula, Gaspe, Q.
(2) †Baker, Chris. W., Carlingford, Ont.
†Barnes, W. M., Montreal.
†Bates, C. J. L., Montreal.
Bovey, Francis H. W., Montreal.
Cameron, Dakers, Montreal.
†Campbell, R. P., Montreal.
Carruthers, C., Alywin, Q.
Couture, Gui. C., Montreal.
Davidson, Macfarlane B., Ottawa.
Dunlop, Alan C., Montreal.
Dutaud, Gustave, St. Blaise, Q.
Fee, James E., Farnham, Q.
Fisher, Lawrence H., Trenholme, Ont.
*Fripp, Geo. D., Ottawa.
*Harris, Alan Dale, Ottawa.
Healy, Walter J., Richmond, Q.
†Hoffman, Albert C., Haleys, Ont.
Holman, Wm. L., Summerside, P.E.I.
†Holt, C. M., Montreal.
†Jackson, C. W., Montreal.
Johnson, Walter S., Montreal.
Lockhart, A. R. B., Stanstead, Q.
Lomer, Gerhard R., Montreal.
Luttrell, H. P., Montreal.
MacKay, Eric B., Montreal.
†MacKenzie, J. D., Inverness, Q.
(2) †McCutcheon, O. F., Leed's Village, Q.
(2) †McEachran, R., Glen Arm, Ont.
†McIntosh, D., Montreal.
(2) †McKenzie, J. D., Montreal.
McMorran, T. S., Ottawa.
†Mitchell, George S., Linden, N.B.
†Morrow, C. W., Strathroy, Ont.
Mowatt, Edward E., Montreal.
Parkins, Edgar R., Montreal.
Seaman, Jno. C., Otter Lake, Q.
(2) †Sharpe, James H., Clydesdale, Ont.
Simister, Warren, Montreal.
Troop, G. Wm. H., Montreal.
†Woodside, James H., St. Sylvester W., Q.

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* *Double Course.* † *Partial.* ‡ *Conditioned.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

FOURTH YEAR.

Adams, Chauncey A., Coaticook, Q.
†Bartlett, J. W., Bingus, Nfld.
†Benn, R. H. D., Westmount, Q.
Blagrave, Robt. C., Rawdon, Q.
*Brodie, Hugh H., Westmount, Q.
Carson, Herman A., Nicolet Falls, Q.
†Cleland, A. S., Ormstown, Q.
*Cole, George E., Westmount, Q.
Crothers, Harold R., Venice, Q.
Crowell, Sam. G., Yarmouth, N.S.
*Harris, Spencer L. D., Ottawa.
†Howard, Fred. S., Blackstock, Ont.
Ireland, F. Chas., Montreal.
Irving, George, Vernon Bridge, P.E.I.
Jack, Milton, Chateauguay Basin, Q.
*McDonald, Jno. A., Valleyfield, Q.
(3) †McEachran, R., Glen Arm, Ont.
(3) †Mitchell, Geo. S., Linden, N.S.
Munn, W. Clement, Quebec, Q.
*Murphy, Herbert H., Antrim, Ont.
(2) †Ormiston, A., Columbus, Ont.
Parker, Dan. T., Cambria, Q.
Plant, Verner L., Montreal.
*Pruyn, Wm. G., Napanee, Ont.
Reid, Allan S., Lemesurier, Q.
(3) †Sharpe, James H., Clydesdale, Ont.
Walker, Jno. J., Napanee, Ont.
†Whiteside, Robert E., Metcalfe, Ont.
(3) †Woodside, Jas. H., St. Sylvester West, Q.

FOURTH YEAR.

GRADUATE STUDENTS.

Duguid, Colin, Montreal.
Lochead, A. W., North Gower, Ont.
McDonald, John, Montreal.

Royal Victoria College.

FIRST YEAR.

†Allan, Ruth E., Montreal.
†Armstrong, B. M., Montreal.
†Arthy, Phyllis E., Montreal.
†Baird, I. Lena, Andover, N.B.
†Baker, Maud H., Montreal.
†Brodie, Mary R., Smith's Falls, Ont.
‡Bowman, N. F. G., Glencoe High School, Ont., Montreal.
‡Braidwood, Helen, Westmount Academy, Westmount, Q.
†Carter, Helen M., Montreal.
†Carter, Gertrude M., Montreal.
†Chipman, E. P. F., Montreal.
†Christie, Theodora, Newcastle, Q.
†Cox, Rachel E., Montreal.

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* *Double Course.* † *Partial.* ‡ *Conditioned.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

†Currie, Ethel M., Westmount, Q.
Featherstonhaugh, M. R., M. G. High School, Montreal.
‡Fraser, Amy, M. G. High School, Montreal.
†Fyshe, Anna, Montreal.
†Gadd, Ethel M., New York, U.S.A.
Gillean, A. Muriel, M. G. High School, Montreal.
†Gilmour, Corinne A., Stanbridge East, Q.
Gilmour, Mary E., Waterloo, Q.
†Gurd, Olive F., Montreal.
Healy, Rose E., Smith's Falls High School, Smith's Falls, Ont.
Hepburn, Flora E., M. G. High School, Montreal.
‡Hill, Julia M., St. Stephens' High School, St. Stephens, N.B.
Idler, S. Mary, M. G. High School, Montreal.
†Jack, Ruth, Chateauguay Basin, Q.
(sc.) Kaye, G. M. Kerr, Montreal.
†Kerr, Vera O., Montreal.
†Kingman, Caroline, Montreal.
†Levy, Lillian S., Montreal.
†Lewis, Edith B., Westmount, Q.
†Lewis, Eugenie, Montreal.
†Lightstone, Pauline, Montreal.
Lyman, Ruth D., Trafalgar Institute, Montreal.
Michaels, R. F., M. G. High School, Montreal.
†Miles, Marion E., Montreal.
Monk, Frances S., Westmount Academy, Westmount, Q.
Munn, Laura A., M. G. High School, Montreal.
†Murray, Bessie C., Montreal.
†Murray, Grace P., Montreal.
†Newman, J. G., Montreal.
†Pearson, Ethel M., Halifax, N.S.
Pearson, Mary F., Edgehill, Windsor, N.S., Emscote, Halifax, N.S.
†Pitblado, Lillian, Winnipeg, Man.
†Prendergast, F. M., Montreal.
†Rodger, Lillian F., Westmount, Q.
†Schoenthal, Yetha E., Westmount, Q.
†Scrimger, E. M., Montreal.
(sc.) Sharp, F. Evelyn, London University Coll., London, Southfield, Jamaica, W.I.
Smith, Ella L., Grammar School, St. John, St. John, N.B.
Smith, May, M. G. High School, Montreal.
†Spencer, Lillian E., Montreal.
Taber, Marion M. D., Stanstead Wesleyan Coll., South Granby, Q.
†Trench, Gertrude S., Montreal.
†Troop, Ettie O. C., Montreal.
Vineberg, Maloa, M. G. High School, Montreal.
†Walker, Gladys, Toronto, Ont.
†White, Ada W., Edinburgh, Scotland.
White, Allison G., Woodstock Coll. Inst., Woodstock, Ont.

SECOND YEAR.

†Arnold, Mima, Westmount, Q.
(1) †Baird, I. Lena, Andover, N.B.
Bell, Ruth, Westmount, Q.
Bouchard, Myra McL., Montreal.
(1) †Carter, Gertrude M., Montreal.
Craig, Bessie, Montreal.
Dickson, Ada, Pembroke, Ont.

† *Partial.* ‡ *Conditioned.*

The figure (1), (2) or 3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

Draper, Mandolin A., Montreal
Freeze, Helen L., St. John West, N.B.
Gardner, H. Ivy L., Montreal.
Griffin, Grace L., Toronto.
†Harrington, Ruth M., Montreal.
Hart, E. Muriel, St. Lambert, Q.
Henry, A. E. Edna, Tamworth, Ont.
Kimber, Victoria, C., Montreal.
†Macfarlane, Grace M., Westmount, Q.
MacKenzie, Catherine I., Montreal.
MacLeod, Annie L., Glace Bay, C.B.
McCally, Mary K., St. Thomas, Ont.
(sc.) McCoy, Isabel, Montreal.
(1) †Pearson, Ethel M., Halifax, N.S.
(1) Pitblado, Lillian, Winnipeg, Man.
Robertson, Ethel C., Westmount, Q.
Simpson, Edith P., Montreal.
Stewart, Lillian J., Ottawa.
Wilson, Alice M., Montreal.

THIRD YEAR.

Angus, Jean M., Westmount, Q.
†Bayne, Olive P., Montreal.
Belyea, Marion E., St. John, N.B.
Blackader, E. M., Montreal.
†Budden, H. A., Montreal.
†Butler, S., Montreal.
(1) †Cox, Rachel E., Montreal.
East, Edith M., Maisonneuve, Q.
(sc.) Gass, Helen, Montreal West, Q.
Griffin, A. Gertrude, West Newton, Mass., U.S.A.
(2) †Harrington, R. M., Montreal.
†Harrington, Claire M., Montreal.
†Haswell, Violet, Montreal.
†James, Ada D., Montreal.
Lundie, Helen, Montreal.
Lunny, Rosemary, Smith's Falls, Ont.
McLeod, Euphemia L., Montreal.
†Mathewson, Amy, Montreal.
Noyes, Emily M., Cowansville, Q.
Parkin, Maude E., Toronto.
†Reekie, Isabella G., Westmount, Q.
†Shepherd, Cecilia, Montreal.
Wales, Grace Julia, Robinson, Q.
Wisdom, Katherine F., St. John, N.B.

FOURTH YEAR.

Bickerdike, May C., Lachine, Q.
Clogg, Vivian E., Westmount, Q.
Day, Daisy W., Montreal Annex, Q.
Dixon, Jennie D., Montreal.
Fraser, Ella M. C., Quebec, Q.
Greenleese, Mary S., Montreal.
Hitchcock, Caroline L., Brockville, Ont.
Irving, Elizabeth, Vernon River Bridge, P.E.I.

† *Partial.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student tades a class in the corrsponding year as well as in that where the name is found.

McLachlan, Jessie W., Guelph, Ont.
Munn, Emma M., Montreal.
Nolan, Annie W., Westmount, Q.
†Smaill, Edith M., Westmount, Q.
Smith, Miriam G., Morrisburg, Ont.
Warriner, J. Eva., Montreal.

GRADUATE STUDENTS.

Brittain, Isabel E., B.A., Montreal.
Hammond, Elizabeth A. B.A., Montreal.
Johnson, Helena, B.A., Montreal.
Macdonald, M.L., B.A., Montreal.
Marcuse, Bella, B.A., Montreal.
Pattison, M. L., B.A., Clarenceville, Q.
Pearson, K. C., B.A., Westmount, Q.
Shaw, S. Louise, B.A., Montreal.

Faculty of Applied Science.

FIRST YEAR.

‡Archibald, Hiram H., Harbour Grace, Nfld.
Bain, James W. L., Montreal.
(2)†Barclay, Charles H., St. Paul, Minn., U.S.A.
(2)‡Beaubien, James de G., Outremont, Q.
‡Belanger, Victor E. A., L'Orignal, Ont.
‡Blackader, Thomas B., Hebron, Yarmouth, N.S.
Blanchet, Guy H., Ottawa.
Bowness, E. W., Kensington, P.E.I.
‡Boyle, Robert W., Carbonear, Nfld.
Burpee, Lockwood, Gibson, N.B.
Campbell, John A., Cheltenham, Ont.
Churchill, Cecil A., Hantsport, N.S.
Cockshutt, Harvey W., Brantford, Ont.
Cram, Alexander S., Smith's Falls, Ont.
Cropper, William C. McL., Kingston, St. Vincent, W.I.
‡Cunha, Staton H. S., Kingston, Jamaica, W.I.
†Curry, Eric M., Amherst, N.S.
Davies, Thomas A., Ottawa.
Dey, William F., Simcoe, Ont.
†Dickson, Wallace, Maisonneuve, Montreal.
Drinkwater, Kenneth E., Montreal.
‡Eadie, George H. H., Montreal.
Frame, Stanley H., Gay's River, Colchester Co., N.S.
Fyshe, Thomas M., Montreal.
Gibbs, Harold E., Port Arthur, Ont.
Gilmour, Reginald B., Westmount, Q.
Glassco, Gordon B., Hamilton, Ont.
‡Greenshields, John G., Montreal.
†Harris, Alan D., Ottawa.
‡Howard, William R., Pueblo, Col., U.S.A.
(2)Hodgson, Cassils V., Montreal.
‡Idsardi, Harold, St. Thomas, Ont.
†Jardine, Ernest I. W., Manitou, Man.
Jewett, F. Coburn, Sheffield, N.B.
‡Johnstone, George A., Radnersville, Ont.

† *Partial.* ‡ *Conditioned.*

The figure (1), (2), or (3), prefixed to a name indicates that the Students takes a class in the corresponding year as well as in that where the name is found.

Jost, Edward B., Guysboro, N.S.
Kydd, George, Montreal.
Lawrie, Edwin W., Glasgow, Scotland.
Lemoine, Louis, Montreal.
Livingstone, Douglas C., Corfield, B.C.
‡MacCosham, Edgar J., Bryson, Q.
MacDermot, Sidney G. F., Gordon Town, Jamaica, W.I.
MacFarlane, John R. N., Westmount, Q.
Mackay, George W., New Glasgow, N.S.
‡Macnab, John J., Elsinore, Bruce Co., Ont.
McIntosh, Robert, Newcastle, Ont.
‡McLachlin, Daniel, Arnprior, Ont.
McLean, Donald, B.A., Campbellton, N.B.
McLeish, Ian, Montreal.
‡Michaels, Michael A., Montreal.
Miner, R. Herbert, Cowansville, Q.
Mooney, Chester A., Ausable Chasm. N.Y., U.S.A.
†Papineau, Talbot M., Owen Sound, Ont.
Pattison, Albert M., Clarenceville, Q.
†Peak, Harry C., Montreal.
‡Pillow, Howard, Montreal.
Pinch, Harry H., Owen Sound, Ont.
Prevost, Armand, Montreal.
†Reaume, Herman C., Montreal.
Redpath, William, Montreal.
‡Ritchie, A. Bruce, Halifax, N.S.
Robb, Frederick G., Montreal.
‡Robb, Roland W., Amherst, N.S.
Robertson, Arthur F., Montreal.
Robitaille, Henry, Quebec, Q.
Roger, Alec., Billings Bridge, Ont.
Rolland, Robert, Montreal.
Ross, Walter G., Port Perry, Ont.
Ryan, John H., Prescott, Ont.
Scouler, Gavin T., New Westminster, B.C.
Sharpe, George P., Agassiz, B. C.
‡Shaughnessy, William J., Montreal.
Skelton, Henry, Montreal.
(2)Sutcliffe, Paul, Poughkeepsie, N.Y., U.S.A.
(2)Sutherland, Daniel H., River John, N.S.
‡Small, Edward A., Montreal.
Turnbull, Harvard, Montreal.
Waterous, Logan M., Brantford, Ont.
Wheaton, Hazen A., Elgin, Albert Co., N.B.
Willard, Charlie, Morrisburg, Ont.
‡Williamson, Alexander J., Montreal.
Wright, Clifton H., Barbadoes, W.I.
‡Young, Horace G., Oznabruck, Ont.

SECOND YEAR.

Anderson, Lewis B., Lunenburg, N.S.
‡Atkinson, M. Brodie, Montreal.
‡Baker, C. Stanley, Hampstead, London, Eng.
(1)Barclay, Chas. H., St. Paul, Minn., U.S.A.
Batchelder, Charles K., Newport, Vt., U.S.A.
(1)‡Beaubien, James de G., Outremont, Q.
Blumenthal, Samuel, Montreal.

‡ *Conditioned.* † *Partial.*

The figure (1), 2), or (3), prefixed to a name indicates that the Students takes a class in the corresponding year as well as in that where the name is found.

(3) Cameron, John A., Toronto.
Campbell, Colin St. G., Aldershot, Ont.
Cardew, John H., Youngs Point, South Beach, Q.
Carlyle, Ernest J., Woodstock, Ont.
Chambers, Robert A., Montreal.
Chaplin, Charles J., Westmount, Q.
*Cole, G. Edwards, Westmount, Q.
Cole, George H., Ottawa.
Crichton, Gordon L., Halifax, N.S.
‡Davis, Patrick, Windsor, Ont.
Dawe, Robert G., Bay Roberts, Nfld.
Devlin, Cecil G., Mohawk, Ont.
Drysdale, William F., Montreal.
(3) Dutcher, Howard K., Charlottetown, P.E.I.
Ells, Sidney G., B.A., Ottawa.
Forbes, Harry L., Waverley, Halifax Co., N.S.
Fraser, Donald MacI., Montreal.
(3) Fraser, Thomas C., New Glasgow, N.S.
Fullington, Moses A., Newport, Vt., U.S.A.
Gnaedinger, Ernest C., Montreal.
Greey, John W. G., Toronto.
Grice, J. H., Bootle, Cumberland, Eng.
Hamilton, Alfred McL., Westmount, Q.
Hamilton, Wilfred, Montreal.
*Harris, Spencer, L. D., Ottawa.
Harvey, John B., Lyndhurst, Ont.
Higgins, Benjamin H., London, Ont.
(1) Hodgson, Cassils V., Montreal.
Hogan, John, Westmount, Q.
†Holland, Gerald A., Montreal.
Johnson, Frederick M. G., Montreal.
Joseph, J. Pinto, Quebec, Q.
Kemp, Robert A., Seaforth, Ont.
Kent, George M., Truro, N.S.
(3) ‡Lambart, Harry F., Ottawa.
Lawrence, William D., Maitland, N.S.
LeMaistre, Frederick J., Westmount, Q.
Lockerby, Robert A., Montreal.
MacCarthy, Arthur K., Ottawa.
(3) †MacNaughton, W. G., B.A., Huntingdon, Q.
Marrotte, Louis H., Westmount, Q.
Martin, Edward N., Haldimand, Ont.
McCloskey, Frederick W., Bolestown, N.B.
McDougall, Clarence H., South Maitland, N.S.
McDougall, George K., Montreal.
McIntyre, Melvil B., Owen Sound, Ont.
McPhee, James C., Baddeck, C.B.
†McMurtry, Gordon O., Montreal.
(3) †Mathers, W. R., St. John, N.B.
Molson, Percival, Montreal.
Morrison, Roy A., Fredericton, N.B.
(3) †Mooijart, Lawrence, Tiverton, Devon, England.
Murdy, Oswald A., Hamilton, Ont.
Parlee, Norman W., Rossland, B.C.
Piché, Ernest A., Montreal.
Pippy, George F., Springhill, N.S.
Porter, William J. D. A., Douglastown, N.B.
(3) †Preston, J. Hal, Montreal.

**Double Course.* ‡*Condiiioned.* †*Partial.*

The figure (1), (2), or (3), prefixed to a name indieates that the Student takes a class in the corresponding year as well as in that where the name is found.

Price, Herbert L., Montmorency, Q.
Roffey, Miles H., Braintree, Essex, Eng.
Sullivan, Michael H., Ottawa.
(1) Sutcliffe, Paul, Poughkeepsie, N.Y., U.S.A.
(1) Sutherland, Daniel H., River John, N.S.
Taylor, Reginald F., Gananoque, Ont.
(3) †Watson, William J., Montreal.
Webster, George B., Montreal.
Wenger, John A., Ayton, Ont.
Wilkes, Frederick C. D., Brantford, Ont.
Wilson, William D., Hamilton, Ont.
Wisdom, Stuart A., Dartmouth, N.S.
Wurtele, John S. H., Acton Vale, Q.

THIRD YEAR.

†Bailey, Henry B., Fredericton, N.B.
Baker, William E., Montreal.
Beauchamp, Leon, Montreal.
Beck, Alfred E., Penetanguishene, Ont.
Blatch, Harry E., St. John's, Nfld.
Boright, Sherman H., Sutton, Q.
Brainerd, Herbert W., Montreal.
Brown, Frederick B., Montreal.
(1) Cameron, John A., Hamilton, Ont.
Cohen, Harris, Montreal.
‡Cole, G. Percy, Montreal.
Conklin, Roscoe N., Winnipeg, Man.
Crawford, Stuart, Montreal.
(2) Dutcher, Howard K., Charlottetown, P.E.I.
(4) Edgar, John H., Montreal.
Egleson, James E. A., Ottawa.
Foreman, Alvah E., Vancouver, B.C.
(2) Fraser, Thomas C., New Glasgow, N.S.
Gale, George G., Quebec, Q.
Haffner, Henry J. A., Winnipeg, Man.
Hall, Oliver, Washington, Ont.
James, Bertram, Heart's Content, Nfld.
Jones, Harold W., Ottawa.
Keith, Fraser S., Smith's Falls, Ont.
Kendall, George, Vancouver, B.C.
(2) †Lambart, Howard F., Ottawa.
Landry, Pierre A., Dorchester, N.B.
Langley, Albert G., Victoria, B.C.
Lawrence, Hugh R., St. George, N.B.
Lodge, W. Lloyd, M.A., Charlottetown, P.E.I.
Lucas, Allen S. B., Hamilton, Ont.
†Lucas, Harry W., Lachine, Q.
(4) Maclaren, Francis F., Huntingdon, Q.
(2) MacNaughton, Wm. G., B.A., Huntingdon, Q.
McCaskill, Kenneth A., Vankleek Hill, Ont.
McDonald, James F., Westville, N.S.
McKay, Frederick A., Montreal.
McKergow, Charles M., Westmount, Q.
Mathers, Wm. R., St. John, N.B.
(2) †Mooijart, Lawrence, Tiverton, Devon, Eng.

†*Partial.* ‡*Conditioned,*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

†Munro, Allan J., Glasgow, Scotland.
Musgrave, Robert, Duncans, B.C.
Musgrave, William N., Duncans, B.C.
Peaslie, Alexander S. L., Defiance, Ohio, U.S.A.
Pemberton, William P. D., Gonzales, Vancouver, B.C.
(4) Porcheron, Alphonse, Montreal.
(2) †Preston, J. Hal, Montmorency, Q.
Richards, Charles C., Charlottetown, P.E.I.
Roberts, Arthur R., Montreal.
†Robillard, Edmond G. F., Montreal.
Rodger, Herbert F., St. John's, Nfld.
Ross, James C., Embro, Ont.
Rowlands, Charles, Albany, N.Y., U.S.A.
Rowley, Lorne E., M.A., Marysville, N.B.
Savage, George M., Montreal.
Scott, Geo. W., Montreal.
Sewell, Alex. L., Quebec, Q.
Stokes, Chas. W., Woodstock, N.B.
Stovel, Joseph H., Toronto.
Thorpe, William H., Montreal.
Tilt, Edwin B., Goderich, Ont.
Trimingham, Charles L., Barbadoes, W.I.
(2) Watson, William J., Montreal.

FOURTH YEAR.

Addie, Thomas H., Sherbrooke, Q.
Baird, Alexander, Sherbrooke, Q.
Bigger, Howell, Ottawa.
Borden, Henry P., Kentville, N.S.
Boyd, Hugh H., Montreal.
†Bristow, Leonard T., Montreal.
Burchell, George R., New Campbellton, N.S.
Cameron, Kenneth M., London, Ont.
Caldwell, Boyd, Lanark, Ont.
Campbell, Charles McK., Winnipeg, Man.
†Canning, William F., St. John's, Nfld.
Cape, Ernest K., Hamilton, Ont.
Corless, Charles V., New Durham, Ont.
Coulson, John D., Toronto.
DePencier, Henry P., Vancouver, B.C.
Dunfield, John C. W., St. John's, Nfld.
(3) Edgar, John H., Montreal.
Franklin, E. L., Wolfville, N.S.
Fry, David M., Bright, Ont.
Heaman, John A., London, Ont.
Hicks, Thomas N., Perth, Ont.
Higman, Ormond, Ottawa, Ont.
Jackson, Philip T., Toronto.
Jamieson, George E. S., Montreal.
Keays, Jas. Alex., Montreal.
Labatt, John S., London, Ont.
MacKay, Eric, St. John's Nfld.
(3) Maclaren, Frank H., Huntingdon, Q.
Maclaren, George McG., Ottawa.
McBride, Wilbert C., Inglewood, Ont.

†*Partial.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

Maxwell, Marshall A., St. Stephen, N.B.
Murphy, William E., Shelburne, N.S.
Newton, Samuel R., Drummondville, Q.
(3) †Percheron, Alphonse, Montreal.
†Roberts, John R., Hamilton, Ont.
Scott, Harry E., Napanee, Ont.
Smith, Gerald M., St. Johns, Q.
Smith, J. Macdonald, New Whatcom, Wash., U.S.A.
Sparrow, Walter F., Montreal.
Sterns, Frank E., Morell, P.E.I.

GRADUATE STUDENTS.

Graton, L. G., Montreal.
Ward, Percy W., Lachine, Q.
Wilson, Reginald C., Cumberland, Ont.

Faculty of Comparative Medicine.

FIRST YEAR.

Carroll, Fred. E., Charlestown, Mass., U.S.A.
Estes, Edward W., Duxbury, Mass. U.S.A.
Gauvin, Chas. J. H., Quebec, Q.
Gray, Fred. N., Antigonish, N.S.
Meakings, E. A., Montreal.
Stoute, Charles P., Belleville, Barbadoes, W.I.
Warren, George D., Milford, Mass., U.S.A.

SECOND YEAR.

Littlehales, J. E., Saltcoats, Assa.
Halcro, G. Hudson Q.

THIRD YEAR.

Blair, W. Reid, Chicopee, Mass., U.S.A.
Gaw, Hugh Clinton Mass., U.S.A.
Spear, W. H., Burlington, Vt., U.S.A.
Hadwen, Seymour, Duncan, B.C.
Douglas, A. R. Montreal.
Harrington A. D., Guysboro, N.S.

Colleges Asscciated in Arts.

STANSTEAD WESLEYAN COLLEGE.

Undergraduates.

FIRST YEAR.

Call, Frank O.
Flanders, John A.

SECOND YEAR.

Bridgette, Sam. J.
Crane, Charles W.
Findlay, Delmer Clinton.

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†*Partial.*

The figure (1), (2), or (3), prefixed to a name indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

1901-02

VANCOUVER COLLEGE.

Undergraduates.

FIRST YEAR.

Bajus, Kathleen Lillian.
Bajus, William P.
Cattell, Dorothy.
Colbeck, Nora Royde.
Donaldson, William Arthur.
Henderson, Eleanor Mildred.
Hepburn, Bertha Anne.
Laverock, Lily Janet.
Leek, Edith Louise.
Milne, Helen Brown.
Price, Thomas Ernest.
Springer, Ruby Maud.
Tarbell, Ellen Gertrude.

Partial.

Bray, Harry Randle.

Summary.

Students in Law			47
Students in Medicine			420
Students in Arts, McGill College:—			
Men—	Graduates	3	
	Undergraduates	125	
	Conditioned	7	
	Partial	30	
Women—	Graduates	8	
	Undergraduates	63	
	Conditioned	4	
	Partial	51	
			291
Students in Arts, Vancouver College			14
Students in Arts, Stanstead College			5
Students in Applied Science:—			
	Graduates	3	
	Undergraduates	199	
	Conditioned	25	
	Partial	24	
			251
Students in Veterinary Science			15
McGill Normal School, Teachers-in-training			156
			1199
Deduct, repeated in different lists			17
Total			1182

University Societies.

Graduates' Society of McGill University.

INCORPORATED 24TH JULY, 1880.

President—Malcolm C. Baker, D.V.S.

Vice-Presidents—Charles W. Wilson, M.D.; Miss Helen R. Y. Reid, B.A.; Archibald MacArthur, B.A.

Secretary—J. Claud Hickson, B.A., B.C.L.

Treasurer—Francis Topp, B.A., B.C.L.

Resident Councillors—A. Rives Hall, B.A., B.C.L.; Frank D. Adams, M.A., Ph.D.; Homer M. Jaquays, M.A.Sc.; E. Fabre Surveyer, B.A., B.C.L.; Howard M. Church, M.D.; W. F. Angus, B.A.Sc.

Non-Resident Councillors—The Presidents of the British Columbia Graduates' Society, the New England Graduates' Society, the New York Graduates' Society, the Maritime Graduates' Society, and the Hon. W. W. Lynch, D.C.L., Knowlton, Que.

McGill Applied Science Society.

Hon-President—Dr. H. T. Bovey.

President—H. P. Borden, Civ. Eng. '02.

Vice-Presidents—C. M. Campbell, Mining Engineering, '02; T. W. Hicks, Mechanical Engineering, '02; J. H. Edgar, Mech. Eng., '02.

Secretary—J. G. Ross, '03.

Treasurer—O. Hall, '03.

2nd Year Representatives—E. J. Carlyle, '04; G. O. McMurtry, B.A., '04; J. J. McNab, '05.

Reporters—C. Rowlands, '03; J. E. A. Egleson, '03; F. E. Sterns, '02; H. Bigger, '02.

Alumnæ Society of McGill University.

President—S. E. Cameron, M.A.

Vice-Presidents—E. Armstrong, B.A.; G. Hunter, B.A.; K. Campbell, B.A.; Dr. Ritchie England, B.A.

Treasurer—Isabel Brittain, B.A.

Rec. Secretary—Eleanor Tatley, B.A.

Assist. Rec. Secretary—I Hurst, B.A.

Cor. Secretary—E. A. Hammond, M.A.

Assist. Cor. Secretary—J. Brown, B.A.

Ottawa Valley Graduates' Society of McGill University.

ORGANIZED 1890.

Hon. President—The Right Hon. Sir Wilfrid Laurier, P.C., K.C.M.G., LL.D.

President—H. M. Ami, LL.D.

Vice-Presidents—P. D. Ross, B.A.Sc.; G. C. Wright, B.A., B.C.L.; Arnold W. Duclos, B.A., B.C.L.

Secretary—J. F. Argue, M.D. (127 Bank St., Ottawa).

Treasurer—A. E. Barlow, D.Sc.

Council—P. D. Ross, B.A.Sc.; G. S. McCarthy, M.D.; A. S. McElroy, M.D.; W. Gamble, B.A., B.C.L.; J. B. Hollingsworth, D.V.S.

New York Graduates' Society of McGill University.

ORGANIZED 1895.

President—Wolfred Nelson, M.D., C.M., F.R.G.S.

1st Vice-President—James Albert Meek, M.D., C.M.

2nd Vice-President—Hiram N. Vineberg, M.D., C.M.

Treasurer—R. A. Gunn, B.A.Sc.

Secretary—W. Ferguson, M.D., C.M. (948 E. 166th St., New York).

Executive Committee—Rev. J. J. Rowan Spong, M.A., B.C.L., LL.B.; Harcourt Bull, B.A.; J. B. Harvie, M.D., C.M. (Troy).

Non-Resident Councillors—Wm. Osler, M.D., C.M., F.R.C.P.L., F.R.S. (Baltimore, Md.); Prof. the Rev. J. C. Bracq, Vassar College, N.Y.; The Right Rev. J. D. Morrison, M.A., D.D., Bishop of Duluth; R. T. Irvine, M.D., C.M.

McGill Graduates' Society of Toronto.

ORGANIZED 1896.

President—A. R. Lewis, Q.C.

1st Vice-President—Rev. Canon Sweeny, M.A., D.D.

2nd Vice-President—H. C. Burritt, M.D.

Secretary-Treasurer—R. B. Henderson, B.A., 48 King Street, West.

Committee—Hamilton Cassels, B.A.; Willis Chipman, B.A.Sc.; P. E. Ritchie, B.A.

The British Columbia Society of Graduates of McGill University.

President—J. M. Lefebvre, M.D. (Vancouver).

Vice-Presidents—W. F. Drysdale, M.D. (Nanaimo); Rev. W. L. Clay, B.A. (Victoria); J. M. McGregor, B.A., B.A.Sc. (Slocan City).

Secretary—W. J. McGuigan, M.D., LL.B. (Vancouver).

Treasurer—Simon J. Tunstall, B.A., M.D. (Vancouver).

Executive Committee—E. C. Hunt, M.D. (Victoria); G. H. Manchester, M.D. (New Westminster); L. Robertson, B.A. (Vancouver); Arthur E. Hill, B.A.Sc. (New Westminster).

Maritime Graduates' Society of McGill University.

Hon. President—John McMillan, M.D. (Pictou, N.S.).

President—Alex. McNeil, M.D. (Kensington, P.E.I.).

Vice-Presidents—J. H. Scammell, M.D. (St. John, N.B.); Henry S. D. Johnson, M.D. (Charlottetown, P.E.I.); J. G. Macdougall, M.D. (Amherst, N.S.).

Secretary-Treasurer—F. A. Corbett, M.D. (Parrsboro, N.S.).

Executive Committee—Geo. Carruthers, M.D. (Charlottetown, P.E.I.); Jas. A. Johnson, M.D. (Emerald, P.E.I.); G. A. B. Addy, M.D. (St. John, N.B.); J. B. Travers, M.D. (St. John, N.B.); J. J. Doyle, M.D. (Halifax, N.S.); H. H. Mackay, M.D. (New Glasgow, N.S.).

McGill Graduates Society of the District of Bedford.

ORGANIZED 1898.

Hon. President—Hon. W. W. Lynch, D.C.L. (Knowlton).

President—Hon. J. C. McCorkill, B.C.L. (Cowansville).

Vice-Presidents—C. J. R. Phelan, M.D. (Waterloo); G. N. Boright, B.Sc. (Sutton); C. L. Cotton, M.D. (Cowansville).

Secretary-Treasurer—G. H. Baker, B.A. (Cowansville).

New England Society of McGill Graduates.

President—Arthur E. Childs, M.Sc. (Boston, Mass.).

1st Vice-President—George A. Fagan, M.D. (North Adams, Mass.).

2nd Vice-President—Ambrose Choquet, B.C.L. (Central Falls, R.I.).

3rd Vice-President—Rev. Robert W. Wallace, B.A. (Somerville, Mass.).

Secretary-Treasurer—Joseph Williams, M.D. (Boston, Mass.; 45 Monument Square).

Councillors—T. G. McGannon, M.D. (Lowell, Mass.); Miles Martin, M.D. (Boston, Mass.); W. W. Goodwin, M.D. (East Boston Mass.); R. T. Glendenning, M.D. (Manchester-by-the-Sea, Mass.); H. Holton Wood, B.A. (Boston, Mass.); Joseph C. Pothier, M.D. (New Bedford, Mass.).

McGill University Alumni Association of Chicago.

ORGANIZED 1900.

President—Leonard St. John, M.D.

1st Vice-President—Clarendon Rutherford, M.D.

2nd Vice-President—Kenneth Moodie, B.A.Sc.

Secretary-Treasurer—Thomas A. Woodruff, M.D.

Committee—D. R. MacMartin, M.D.; W. L. Copeland, M.D.; J. Brown Loring, M.D.

Undergraduates' Literary Society.

CONSTITUTED 1880.

Hon. President—Principal Peterson.

President—H. S. Williams, B.A., Law, '04.

1st Vice-President—W. S. Johnson, Arts, '03.

2nd Vice-President—W. J. Healy, Arts, '03.

Secretary—O. B. McCallum, Arts, '04.

Treasurer—L. Edwards, Arts, '05.

Committee—W. G. Macnaughton, B.A., Sc., '05; G. C. Couture, Arts, '03, I. I. Rubinowitz, Arts, '04; J. Ower, Arts, '05; W. Ogilvie, Law, '04;

Reporters—G. H. Cole, Sc., '04; J. Jenkins, Arts, '05.

Delta Sigma Society.

ESTABLISHED 1884.

President—Katharine Wisdom.

Vice-President—Ada Dickson.

Secretary-Treasurer—Marion Taber.

Committee—Marion Belyea, Kathleen McCally, Frances Moule.

McGill Historical Club.

President—W. J. Healy, Arts, '03.

Vice-President—G. C. Couture, Arts, '03.

Secretary—W. S. Johnson, Arts, '03.

Treasurer—O. B. McCallum, Arts, '04.

Executive Committee—Prof. C. W. Colby, M.A., Ph.D.; G. R. Lomer, Arts, '03; D. G. Campbell, Arts, '04.

The McGill Mining Society.

ORGANIZED 1891.

Hon. President—Dr. J. B. Harrington.

President—C. V. Corless, App. Sci., '02.

Vice-President—W. G. McBride, App. Sci., '02.

Secretary-Treasurer—R. Musgrave, App. Sci., '03.

Second Year Rep.—R. A. Chambers, App. Sci., '04.

McGill Physical Society.

President—Prof. E. Rutherford.
Vice-President—Prof. J. Cox.
Rec. Secretary—Dr. H. T. Barnes.
Cor. Secretary—A. G. Grier, B.Sc.
Executive Committee—Prof. Cox, Prof. Rutherford, Dr. Barnes, Dr. Coker, Mr. Soddy, Mr. Grier.

Young Men's Christian Association of McGill University.

OBJECT—To promote the Christian character of its members and the cause of Christianity in the University.

MEMBERSHIP.—The active Membership of the Association consists of Graduates and Students of the University who are members of some Evangelical church. Any Graduate and Student of good moral character may become an associate member. A social reception is given to new students at the beginning of the session.

Full particulars regarding regular religious services and Bible Study Classes are given in the Hand Book of the Association.

Hon. President—Alex. Johnson, M.A., LL.D., D.C.L.
President—George Turner, B.A., Med., '03.
1st Vice-President—Roscoe Y. Conklin, B.A., Sci., '03.
2nd Vice-President—M. B. Davidson, Arts, '03.
Rec. Secretary—G. O. McMurtry, B.A., Sci., '04.
Treasurer—W. G. MacNaughton, B.A., Sci., '04.
Asst.-Treasurer—L. C. Lauchland, B.A., Med., '04.
Representative from Law—H. H. Brodie.
General Secretary—James R. Cox, M.D.

CHAIRMEN OF COMMITTEES.

Religious Meetings—M. B. Davidson, Arts, '03.
Bible Study—Roscoe Y. Conklin, B.A., Sci., '03.
Social—F. J. Tees, B.A., Med., '05.
Membership—J. A. Faulkner, B.A., Med., '04.
New Students and Handbook—General Secretary.
Bulletin and Reading Room—E. McGougan, Arts, '04.
Missionary—M. Jack, B.A.
Musical—G. H. Cole, Sc., '04.
Building—George Turner, B.A., Med., '03.
Advisory—H. M. Tory, M.A.
Ladies' Auxiliary—Mrs. Johnson.

Young Women's Christian Association.

ESTABLISHED 1887 (AS THEO DORA SOCIETY).

OBJECT.—The development of Christian character in the members, and the development of active Christian work, particularly among the young women of the University. Open for membership to students of the Royal Victoria College for Women.

President—Helen Gass.
Vice-President—Ivy Gardner.
Rec. Secretary—May Idler.
Cor. Secretary—Grace Wales.
Treasurer—Nora Bowman.
Reporter—E. Smith.

McGill University Athletic Association.

ESTABLISHED 1884.

Hon. President—R. Tait MacKenzie, B.A., M.D.
Hon. Treasurer—Prof. C. H. McLeod, Ma.E.
President—E. J. Carlyle, Sc., '04.
Vice-President—G. M. Gibson, Med., '03.
Treasurer—R. St. J. McDonald, Med., '03.
Secretary—J. G. Ross, Sci., '03.

Representatives:—Law—Ernest Rankine, '03; Arts—E. R. Parkins, '03; Medicine—R. W. Kenny, '03; Science, G. M. Kent, '04; Football—F. S. Patch, B.A. Med., '03; Cricket—P. Molson, B.A., Sci., '04; Skating and Hockey—P. Molson, B.A., Sci., '04; Basketball—G. P. Cole, Sci., '03.

McGill University Football Club.

Hon. President—Prof. C. H. McLeod.
Hon. Treasurer—Dr. R. F. Ruttan.
President—F. S. Patch, B.A., Med., '03.
Vice-President—R. N. W. Shillington, Med., '03.
Hon. Secretary—John A. Cameron.
Treasurer—W. Molson, Arts, '03.
Manager—L. L. Reford, B.A., Med., '04.

Committee:—Arts—G. C. McDonald, '04; H. W. Molson, '05. Law—C. G. Mackinnon, B.A., '03; E. W. MacDougall, '04. Medicine—R. W. Kenny, '03; J. J. Gibson, '04. Science—R. F. Taylor, '04; G. P. Sharpe, '05.

McGill University Cricket Club.

Hon. President—Lord Strathcona and Mount Royal.
President—Prof. C. E. Moyse.
Vice-President—A. R. Oughtred, B.C.L.
Secretary-Treasurer—Percy Molson, B.A.
Assist. Secretary—W. C. Baber.
Captain—H. Cyril Hill.
Committee—E. H. McLea, B.Sc.; W. W. Walker; E. E. Macdonald, Med., '01; Hugh W. Wonham; E. T. Peck.

McGill Lawn Tennis Club.

President—J. Arthur Fairie, M.A., '01.
Vice-President—L. Macfarlane, B.C.L.
Secretary—J. J. Meagher, Arts, '01.
Treasurer—R. N. Hickson, Arts, '01.
Committee:—Arts—P. Molson, '01. Law—W. W. Skinner, '01. Medicine— F. F. Wilkins, '01. App. Science—H. M. Scott, '01.

McGill University Skating and Hockey Club.

Hon. President—Prof. S. H. Capper.
President—P. Molson, B.A., Sci., '04.
Vice-President—S. D. Harris, Arts, '02.
Secretary—L. S. Mackid, Med., '04.
Treasurer—G. O. McMurtry, Sci., '04.
Manager—F. H. McLaren, Sci., '03.
Committee : Law—C. G. Mackinnon, '03; A. H. Duff, '02; E. W. McDougall, '05. Medicine—W. S. M. Carter, '02; C. R. Gilmour, '03; J. D. G. MacCallum, '04. Arts—C. A. Young, '05; J. A. McDonald, '02; —. Dunlop, '03; G. C. Macdonald, '04; H. B. Molson, '05. Science —F. H. McLaren, '03; J. H. S. Würtele, '04; K. Drinkwater, '05.

McGill Basket Ball Club.

Hon. President—Dr. R. Tait McKenzie.
President—G. P. Cole, Sci,
Vice-President—R. St. J. McDonald, Med.,
Secretary-Treasurer—G. M. Gibson, Med.,
Captain—B. H. Higgins, Sci.,

R. V. C. Athletic Club.

President—Euphemia McLeod.
Vice-President—Ada Dickson.
Secretary-Treasurer—Mary Pearson.

Benefactors of McGill University, Montreal.

I. General Endowments and Subscriptions.

1. Original Endowment, 1811.

THE HONORABLE JAMES McGILL, who was born at Glasgow, 6th Oct., 1744, and died at Montreal, 19th Dec., 1813, by his last will and testament, under date 8th January, 1811, devised the estate of Burnside, situated near the city of Montreal, and containing forty-seven acres of land, with the Manor House and Buildings thereon erected, and also bequeathed the sum of ten thousand pounds in money unto the "Royal Institution for the Advancement of Learning," a Corporation constituted in virtue of an Act of Parliament passed in the Forty-first Year of the Reign of His Majesty, King George the Third, to erect and establish a University or College, for the purpose of Education and the advancement of learning, in the Province of Lower Canada, with a competent number of professors and teachers to render such Establishment effectual and beneficial for the purposes intended; requiring that one of the colleges to be comprised in the said University should be named and perpetually be known and distinguished by the appellation of "McGill College."

The value of the above mentioned property was estimated at the date of the bequest at.. .. ..$120,000

2. University Buildings, Etc.

THE WILLIAM MOLSON HALL, being the west wing of McGill College Buildings, with the connecting Corridors and Class Rooms, was erected in 1861, through the munificent donation of the founder, whose name it bears.

THE PETER REDPATH MUSEUM, the gift of the donor whose name it bears, was announced by him as a donation to the University in 1880, and formally opened August, 1882.

Lots for University buildings adjoining the College grounds confronting on McTavish St., presented by J. H. R. Molson, Esq.,—$42,500.

THE UNIVERSITY LIBRARY BUILDING, the gift of Peter Redpath, Esq., announced by him as a gift to the University in 1891, and formally opened October 31st, 1893. Enlarged by Mrs. Peter Redpath in 1900.

UNIVERSITY OFFICES, Rooms in East Wing, remodelled and furnished for offices of Principal and Secretary and for a Board Room, by Sir Wm. C. Macdonald, in 1895.

3. Endowed Chairs, Etc.

THE JOHN FROTHINGHAM PRINCIPAL FUND, to be invested for the endowment of the Principalship of the University; founded in 1889 by the Rev. Frederick Frothingham and Mrs. J. H. R. Molson,—$40,000.

THE MACDONALD AUXILIARY FUND, founded in 1897 by Sir Wm. C. Macdonald, the interest to be used solely to maintain the income of certain of his endowments on a five per cent. per annum basis,—$361,250.

4. Endowments and Donations of Medals and Prizes.

1883, a Gold, a Silver and a Bronze Medal were given by R. J. Wicksteed, Esq., M.A., LL.D., for competition in "Physical Culture," by students in the Graduating Class and second year of any Faculty, who have attended the University Gymnasium. The Gold Medal was continued to 1889 and the Silver and Bronze have been continued to date.

Ottawa Valley Graduates' Society's Exhibition. For competition by candidates from the Ottawa Valley at the June matriculation examinations of any Faculty. Value, $50.00. Given annually, 1895 to 1899.

A Prize given by the British Columbia Society of Graduates of McGill University to be divided amongst the five Faculties. Annual value $50.00. Given annually, 1836 to 1898.

5. Subscriptions to General Endowment.

1856.

John Frothingham, Esq.	$2000	Forward	$19,200
John Torrance, Esq.	2000	Moses E. David, Esq.	600
James B. Greenshields, Esq.	1200	Wm. Carter, Esq.	600
Wm. Busby Lambe, Esq.	1200	Thomas Patton, Esq.	600
Sir George Simpson, Knight.	1000	Wm. Workman, Esq.	600
Henry Thomas, Esq.	1000	Hon. Luther H. Holton	600
John Redpath, Esq.	1000	Henry Lyman, Esq.	600
James McDougall, Esq.	1000	David Torrance, Esq.	600
James Torrance, Esq.	1000	Edwin Atwater, Esq.	600
Hon. James Ferrier	1000	Theodore Hart, Esq.	600
Harrison Stephens, Esq.	800	Wm. Forsyth Grant, Esq.	600
Henry Chapman, Esq.	600	Robert Campbell, Esq.	600
Hon. Peter McGill	600	Alfred Savage, Esq.	600
John James Day, Esq.	600	James Ferrier, jun., Esq.	600
Thomas Brown Anderson, Esq.	600	Wm. Stephen, Esq.	600
Peter Redpath, Esq.	600	N. S. Whitney, Esq.	600
Thomas M. Taylor, Esq.	600	William Dow, Esq.	600
Joseph Mackay, Esq.	600	William Watson, Esq.	600
Donald Lorn McDougall, Esq.	600	Edward and Alicia Major	600
Hon. Sir John Rose	600	Hon. Sir A. T. Galt	360
Charles Alexander, Esq.	600	John R. Esdaile, Esq.	200
Forward	$19,200	Total	$30,560

1871.

John Frothingham, Esq.	$5150	Forward	$24,350
William Molson, Esq.	5000	T. W. Ritchie, Esq.	300
Sir William C. Macdonald	5000	Messrs. Sinclair, Jack & Co.	250
Thomas Workman, Esq.	5000	John Reddy, M.D.	100
J. H. R. Molson, Esq.	2000	Wm. Lunn, Esq.	100
John McLennan, Esq.	1000	Hon. F. W. Torrance.	60
B. Gibb, Esq.	600	Wm. Rose, Esq.	50
Messrs. A. & W. Robertson.	600		
Forward	$24,350	Total	$25,210

1881-82.

Hugh McLennan, Esq.	$5000	Forward	$21,000
Hon. G. A. Drummond	4000	O. S. Wood, Esq.	1000
George Hague, Esq.	3000	J. B. Greenshields, Esq. (London)	1000
M. H. Gault, Esq.	2000	Warden King, Esq.	1000
Andrew Robertson, Esq.	1000	W. P. Cumming, Esq.	1000
Robertson Campbell, Esq.	1000	Mrs. Hew Ramsay	500
Sir Jos. and Lady Hickson	1000	R. A. Ramsay, Esq.	500
Mrs. Andrew Dow.	1000	H. H. Wood, Esq.	500
Alexander Murray, Esq.	1000	James Burnett, Esq.	500
Miss Orkney	1000	Charles Gibb, Esq.	500
Hector McKenzie, Esq.	1000	J. S. McLachlan, Esq.	200
Forward	$21,000	Total	$27,700

1883-84.

Edward Mackay, Esq. $5,000

6. Endowment Fund for General Purposes.

1897.

Bequest of the late John H. R. Molson, Esq., $100,000.

7. Subscription for Improvements to College, 1856.

Hon. Charles Dewey Day $200

8. Subscriptions for Current Expenses, 1881-82.

Principal Dawson					$1000
J. H. R. Molson	$1000	per	annum,	5 years, being	5000
Lord Mountstephen.	1000	"	"	" ..	5000
Lord Strathcona and Mount Royal..	1000	"	"	" ..	5000
David Morrice, Esq.	200	"	"	" ..	1000
Messrs. Gault Brothers & Co. ..	200	"	"	" ..	1000
Messrs. S. H. & A. S. Ewing ..	200	"	"	" ..	1000
Hon. Robert MacKay	300	"	2 "	" ..	600
Jonathan Hodgson, Esq.	100	"	5 "	" ..	500
Geo. M. Kinghorn, Esq.	100	"	"	" ..	500
David J. Greenshields, Esq.. ..					300
Thomas Craig, Esq.	100	"	2 "	" ..	200
John Rankin, Esq.					200
John Duncan, Esq.					200
George Brush, Esq., $25 for five years, being					125
Robert Benny, Esq.					100
Miss E. A. Ramsay					100
Hugh Paton, Esq., $50 for two years, being					100
J. M. Douglas, Esq.					50
James Court, Esq.					50
Total					$22,025

1887-88.

John H. R. Molson, Esq.	$1000	per	annum,	3 years, being	$3000
Sir Wm. C. Macdonald	1000	"	"	" ..	3000
Peter Redpath, Esq.	1000	"	"	" ..	3000
Lord Strathcona and Mount Royal	1000	"	"	" ..	3000
Hon. James Ferrier.	500	"	"	" ..	1500
Sir Joseph Hickson	500	"	"	" ..	1500
Hugh McLennan, Esq..	250	"	"	" ..	750
E. B. Greenshields, Esq.	250	"	"	" ..	750
George Hague, Esq..	250	"	"	" ..	750
John Molson, Esq.	250	"	"	" ..	750
Samuel Finley, Esq..	250	"	"	" ..	750
Mrs. Mackay, $100 annually, 1889 to 1893					500
Total					$19,250

9. Subscription by Members of Board of Governors, in

1898-99.—$191,000.

10. Subscriptions for a Building for the Carpenter Collection of Shells.

1868.

Peter Redpath, Esq. .. .. ..$	500	Forward .. ..$	1,600
William Molson, Esq...	500	Geo. H. Frothingham, Esq.	100
Harrison Stephens, Esq.. ..	100	Wm. Dow, Esq..	100
Robert J. Reekie, Esq.	100	Thomas Rimmer, Esq.	100
John H. R. Molson, Esq. ..	100	Andrew Robertson, Esq.. ..	100
Sir Wm. E. Logan, F.R.S...	100	Mrs. Redpath	100
John Molson, Esq.	100	Benaiah Gibb, Esq.	50
Thos. Workman, Esq., M.P.	100	Hon. John Rose..	50
Forward .. ..$	1,600	Total .. ..$	2,200

11. Subscriptions for the Erection of the Lodge and Gates.

William Molson, Esq.. .. ..$	100	Forward .. ..$	1,100
John H. R. Molson, Esq.. ..	100	John Frothingham, Esq... ..	100
William Workman, Esq.. ..	100	James A. Mathewson, Esq..	100
Joseph Tiffin, jun., Esq.	100	Peter Redpath, Esq.	100
Thos. J. Claxton, Esq.	100	G. H. Frothingham, Esq. ..	100
James Linton, Esq.	100	G. D. Ferrier, Esq.	100
William McDougall, Esq. ..	100	John Smith, Esq.	100
Charles J. Brydges, Esq... ..	100	Charles Alexander, Esq.. ..	100
Hon. George A. Drummond.	100	J. Evans, Esq.	100
Thomas Rimmer, Esq.	100	Henry Lyman, Esq.	50
William Dow, Esq.	100	Total .. ..$	1,950
Forward .. ..$	1,100		

12. Library and Museum.

Special Collections of Books Presented to the Library.

1. The Peter Redpath Collection of Historical Books, presented by Peter Redpath, Esq., of Montreal, 3,500 Volumes, with subsequent additions.
2. The Robson Collection of works in Archæology and General Literature, presented by Dr. John Robson, of Warrington, England, 3,436 Volumes.
3. The Charles Alexander Collection of Classical Works, presented by C. Alexander, Esq., of Montreal, 221 Volumes.
4. Frederick Griffin, Esq., Q.C., Collection of Books, being the whole of his Library, bequeathed by his will, 2,695 Volumes.
5. The Hon. Mr. Justice Mackay, Collection of Books, being the whole of his Library, 2,007 Volumes.
6. The "T. D. King Shakespeare Collection," presented by Lord Strathcona and Mount Royal and Sir W. C. Macdonald, of Montreal, being 214 Volumes.
7. The Ribbeck Library of Classical Literature, presented by Sir W. C. Macdonald, about 4,000 works.
8. The "Mendelssohn Choir Memorial Collection," presented by Joseph Gould, Esq., 200 volumes.
9. The "John Horne" Collection of Canadian Portraits and Autographs, 177 in all.
10. The Sir J. W. Dawson Collection of works in Geology and Palæontology, presented by the Board of Governors.

Endowments for Library.

Wm. Molson, Esq., for Endowment of a Library Fund (1871)..$	4,000
Hon. F. W. Torrance for Endowment of Mental, Moral and Political Philosophy Book Fund (1876)	1,000
Mrs. Redpath, for the Endowment of the Wm. Wood Redpath Memorial Fund (1881)..	1,000

A Friend, by the Hon. F. W. Torrance, for Endowment of a Library Fund (1882)	400
Hugh S. McLennan, Library Endowment, a gift from Estate late Hugh S. McLennan to the Library of McGill College, the income to be applied to binding (1892)	250
Total	$ 6,650

Subscriptions, Etc., to Library.

John Thorburn for purchase of Books	$ 90
Andrew Drummond, do., for Applied Science	25
The Graduates in Arts and Applied Science of 1885 for purchase of Books	31
Ditto, ditto, of 1886	28
The late R. A. Ramsay, Esq., Bequest for purchase of books (1887)	1,000
Andrew Drummond, Esq., to Library Fund of Faculty of Applied Science	25
Lord Strathcona and Mount Royal, for purchase of books from the R. W. Boodle Library	200
Ottawa Valley Graduates' Society, for binding books in the University Library	25
Peter Redpath, Esq., in aid of the new catalogue of the Library (1892)	500
Mrs. Peter Redpath, for maintenance of Library, 1894 to date	40,500
Lord Strathcona and Mount Royal, donation for the purchase of books for the Library, particularly in the French Department (1897)	250
John H. R. Molson, donation for purchase of books for the Library (1897)	195
Hon. Treas. Redpath Memorial Fund, London, England. The balance remaining over of the above fund to be used for purchase of books for the Library	47
Estate late Hugh McLennan, for support of Travelling Libraries	1,500
Total	$44,416

Special Collections Presented to the Museum.

1. The Holmes Herbarium, presented by the late Andrew F. Holmes, M.D.
2. The Carpenter Collection of Shells, presented by the late P. P. Carpenter, Ph.D.
3. The Collection of Casts of Ivory Carvings, issued by the Arundel Society, presented by Henry Chapman, Esq.
4. The McCulloch Collection of Birds and Mammals, collected by the late Dr. M. McCulloch, of Montreal, and presented by his heirs.
5. The Logan Memorial Collections of Specimens in Geology and Natural History, presented by the heirs of the late Sir W. E. Logan, LL.D., F.R.S.
6. The Dawson Collection in Geology and Palæontology, being the Private Collections of Principal Dawson, presented by him to the Museum.
7. The Bowles Collection of Lepidoptera, presented by Sir Wm. C. Macdonald and J. H. Burland, Esq.
8. R. Morton Middleton, Jr., London, Eng., Collection of Plants.
9. Collection of Butterflies, presented by the Members of the Board of Governors of the University.
10. Collection of Lepidoptera, presented by Sir W. C. Macdonald. (See also "List of Donations to the Library and Museum," printed in the Annual Report of the University and Report of the Museum.)

Endowment for the Museum.

Wm. Molson, Esq., for the Endowment of a Museum Fund (1873) .. .. ..

II. Endowments and Subscriptions for the Faculty of Arts.

1. Buildings, Chairs, Etc.

Endowment Fund, 1856.

John Gordon McKenzie, Esq... .. ..$2,000
Ira Gould, Esq... .. .. 2,300—Total, $4,300

THE MOLSON CHAIR OF ENGLISH LANGUAGE AND LITERATURE, in 1856, endowed by the Honorable John Molson, Thomas Molson, Esq., and William Molson, Esq.—$20,000; and supplemented in 1892 by John H. R. Molson, Esq., with a further sum of $20,000. Total, $40,000.

THE PETER REDPATH CHAIR OF PURE MATHEMATICS (founded as Chair of Natural Philosophy), in 1871, endowed by Peter Redpath, Esq., $20,000.

THE LOGAN CHAIR OF GEOLOGY, in 1871, endowed by Sir W. E. Logan, LL.D., F.R.S., and Hart Logan, Esq.—$20,000.

THE JOHN FROTHINGHAM CHAIR OF MENTAL AND MORAL PHILOSOPHY, 1873, endowed by Miss Louisa Frothingham,—$20,000; and supplemented in 1891 with a further sum of $20,000. Total $40,000.

THE MAJOR HIRAM MILLS CHAIR OF CLASSICS, in 1882, endowed by the last will of the late Major Hiram Mills, of Montreal,—$42,000.

THE DAVID J. GREENSHIELDS ASSOCIATE PROFESSORSHIP OF ENGLISH LITERATURE, endowed by the last will of the late David J. Greenshields, Esq., of Montreal, with the sum of $40,000.

THE MACDONALD CHAIRS OF PHYSICS, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald,—$120,000.

THE MACDONALD CHAIRS OF CHEMISTRY, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald, in 1897 and 1901,—$110,000.

THE MACDONALD CHAIR OF BOTANY, endowed by Sir William C. Macdonald, in 1901,—$50,000.

THE WILLIAM DOW CHAIR OF POLITICAL ECONOMY, 1901, endowed by the Misses Dow,—$60,000.

THE CHARLES GIBB BOTANICAL ENDOWMENT, subscriptions received to date :

A Friend.. .. ..$8,000
Mrs. Catherine Hill. .. .. 200—Total, $8,200

THE MACDONALD PHYSICS BUILDING AND EQUIPMENT, in the Faculties of Arts and Applied Science. The gift of Sir William C. Macdonald, announced by him as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD PHYSICS BUILDING MAINTENANCE FUND in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald, in 1892 and 1896, $150,000.

THE MACDONALD CHEMISTRY AND MINING BUILDING AND EQUIPMENT, given to the University by Sir William C. Macdonald, in 1896, $267,141.80.

THE MACDONALD CHEMISTRY AND MINING BUILDING MAINTENANCE FUND, endowed by Sir William C. Macdonald, in 1897 and 1899, $225,000.

THE MACDONALD CHEMISTRY ENDOWMENT FUND, endowed by Sir William C. Macdonald, in 1890, $135,000.

THE KINGSFORD CHAIR OF HISTORY, endowed by Sir Wm. C. Macdonald, in 1898, $50,000.

THE DAWSON CHAIR OF GEOLOGY, endowed by Sir Wm. C. Macdonald in 1899, $50,000.

THE MACDONALD BUILDINGS REPAIR FUND, endowed in 1900 by Sir William C. Macdonald, $15,000.

2. Endowment for Pension Fund.

This endowment was given in 1894 to be invested and the revenue used exclusively for providing Pensions or Retiring Allowances for members of the teaching staff of the Faculties of Arts and Applied Science.

Lord Strathcona and Mount Royal.$50,000
John H. R. Molson.. 50,000
Sir William C. Macdonald .. .. 50,000—Total, $150,000

3. Exhibitions and Scholarships, Etc.

THE JANE REDPATH EXHIBITION, in the Faculty of Arts,—founded in 1868, by Mrs. Redpath, of Terrace Bank, Montreal, and endowed with the sum of $1,667.

THE MACDONALD SCHOLARSHIPS AND EXHIBITIONS, 10 in number, in the Faculty of Arts—founded in 1871, and endowed in 1882 with the sum of $25,000 by Sir William C. Macdonald.

THE CHARLES ALEXANDER SCHOLARSHIP, for Classics—founded in 1871 by Charles Alexander, Esq. Endowed in 1893 with the sum of $2,000.

THE BARBARA SCOTT SCHOLARSHIP FOR CLASSICAL LANGUAGE AND LITERATURE—founded in 1884 by the last will of the late Miss Barbara Scott, of Montreal, and endowed with the sum of $2,000.

THE GEORGE HAGUE EXHIBITION—founded in 1881—Annual value $125.

THE MAJOR HIRAM MILLS MEDAL AND SCHOLARSHIP—founded by the will of the late Major Hiram Mills, of Montreal, and endowed with the sum of $1,500.

T. M. THOMPSON, ESQ.—$250 for two Exhibitions in September, 1871; $200 for two Exhibitions in 1872,—$450.

REV. COLIN C. STUART—for the "Stuart Prize in Hebrew,"—$60.

THE TAYLOR SCHOLARSHIP—founded in 1871, by T. M. Taylor, Esq.—Annual value $100—terminated in 1878.

PROFESSOR ALEXANDER JOHNSON—for Scholarship for three Sessions, terminated 1886-87—$350.

HER MAJESTY'S COMMISSION for the Exhibition of 1851—Nomination Scholarships for 1891, 1893, 1895, 1897, 1899 and 1901, value £150 annually, tenable for two years.

THE PHILIP CARPENTER FELLOWSHIP—founded by Mrs. Philip Carpenter, for the Maintenance of a Post-Graduation Teaching Fellowship or Scholarship in Natural Science or some branch thereof in the Faculty of Arts in McGill College, endowed in 1892 with the sum of $7,000.

THE ALEXANDER MACKENZIE MEMORIAL FUND, founded by the friends of the late Hon. Alex. Mackenzie, for the maintenance of fellowships or scholarships in Political Science, $9,534.05.

A Lady, to provide for three tuitions in the Faculty of Arts for sessions 1892-93 1893-94.

THE NEW YORK GRADUATE SOCIETY EXHIBITION—for an Exhibition in the Faculty of Arts to be associated with the name of Sir William Dawson—Annual value $60—given in 1897, 1898, 1901.

To provide Bursaries in the Faculty of Arts, subscriptions from

W. W. Ogilvie.. .. ..1898 and 1899....$2,000
Hugh McLennan.. ..1898 and 1899.... 240
D. Macmaster .. .. ..1898.. 120

4. Endowments and Donations of Medals and Prizes.

In 1856 Henry Chapman, Esq., founded a gold medal, to be named the "Henry Chapman Gold Medal," to be given annually in the graduating class in Arts. This medal was endowed by Mr. Chapman in 1874 with the sum of $700.

In 1860 the sum of £200, presented to the College by H.R.H. the Prince of Wales, was applied to the foundation of a Gold Medal, to be called the "Prince of Wales Gold Medal," which is given in the graduating class for Honour Studies in Mental and Moral Philosophy.

In 1864 the "Anne Molson Gold Medal" was founded and endowed by Mrs. John Molson, of Belmont Hall, Montreal, for an Honour Course in Mathematics and Physics.

In the same year the "Shakespeare Gold Medal," for an Honour Course, to comprise and include the works of Shakespeare and the Literature of England from his time to the time of Addison, both inclusive, and such other accessory subjects as the Corporation may from time to time appoint, was founded and endowed by citizens of Montreal, on occasion of the three hundredth anniversary of the birth of Shakespeare.

In the same year the "Logan Gold Medal" for an Honour Course in Geology and Natural Science was founded and endowed by Sir William Logan, LL.D., F.R.S., F.G.S., etc.

In 1874 a Gold and a Silver Medal were given by His Excellency the Earl of Dufferin, Governor General of Canada, for competition in the Faculty of Arts, and continued till 1878.

In 1875 the "Neil Stuart prize in Hebrew" was endowed by Neil Stuart, Esq., of Vankleek Hill, in the sum of $340.

In 1880 a Gold and a Silver Medal were given by His Excellency the Marquis of Lorne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1883.

In 1884 a Gold and a Silver Medal were given by His Excellency the Marquis of Lansdowne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1888.

In 1889 a Gold and a Silver Medal were given by His Excellency Lord Stanley, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1893.

THE "CHARLES G. COSTER MEMORIAL PRIZE" for general proficiency —given annually by Colin H. Livingstone, Esq., B.A.; founded in 1889.

In 1894 a Gold and a Silver Medal were given by His Excellency the Earl of Aberdeen, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1898.

In 1899 a Gold and a Silver Medal were given by His Excellency the Earl of Minto, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued to date.

5. Subscriptions for the Support of the Chair of Botany. 1883-84.

Sir Wm. Dawson	$500	per annum,	5	years,	being	$2500
Lord Strathcona and Mount Royal	250	"	"	"		1250
J. H. R. Molson, Esq.	100	"	"	"		500
Mrs. J. H. R. Molson	100	"	"	"		500
G. Hague, Esq.	100	"	"	"		500
Mrs. Redpath	100	"	"	"		500
Hugh McKay, Esq.	100	"	"	"		500
Robert Moat, Esq.	100	"	"	"		500
Sir Wm. C. Macdonald.	100	"	"	"		500
Charles Gibb, Esq.	50	"	"	"		250
Miss Orkney	50	"	"	"		250
Robert Mackay, Esq.	50	"	"	"		250
Mrs. Wm. Molson.	50	"	"	"		250
Mrs. John Molson.	50	"	"	"		250
John Stirling, Esq.	50	"	"	"		250
Warden King, Esq.	50	"	"	"		250
Miss Hall	50	"	"	"		250

Robert Angus, Esq.	$50	per annum,	5	years,	being	$250
D. A. P. Watt, Esq.	50	"	"	"	"	250
Hugh McLennan, Esq.	25	"	"	"	"	125
Sir Joseph Hickson	10	"	"	"	"	50
Mrs. Phillips						20
Total						$9,945

6. Botanic Garden, Etc.

Subscriptions, 1890-91.

Hugh McLennan, Esq.	$ 100	Forward	$ 900
Gilman Cheney, Esq.	100	Jonathan Hodgson, Esq.	100
James Johnston, Esq.	100	Robert Mackay, Esq.	100
James Slessor, Esq.	100	H. Shorey, Esq.	50
A Friend	100	J. S. Shearer, Esq.	50
Hugh Graham, Esq.	100	Geo. Sumner, Esq.	25
A. F. Gault, Esq.	100	A. Ramsay & Co.	25
W. T. Costigan, Esq.	100	Garth & Co.	25
Jonathan Brown, Esq.	100		
Forward	$ 900	Total	$1,275

To Erect Plant House in Botanic Garden.

Lord Strathcona and Mount Royal	$ 362.00
John H. R. Molson, Esq.	361.51
Sir William C. Macdonald	361.02
Total	$1084.53

For Support of Botanical Laboratory.

Sir W. C. Macdonald (1900)	$ 300.00

7. Subscriptions in Aid of the Chair of Hebrew.

Warden King, Esq.	in 1889	$50	per annum,	3	years,	being	$ 150
Sir William Dawson.	"	50	"	"	"	"	150
Hon. Hugh Mackay	"	50	"	"	"	"	150
A. F. Gault, Esq.	"	25	"	"	"	"	75
Geo. Hague, Esq.	"	25	"	"	"	"	75
T. A. Dawes, Esq.	"	25	"	"	"	"	75
S. Carsley, Esq.	"	25	"	"	"	"	75
S. Davis, Esq.	in 1892						20
Warden King, Esq.	"	50	per annum	for	3	years	150
A. F. Gault, Esq.	"	50	"	"			150
Robert Mackay, Esq.	"	50	"	"			150
Hugh McLennan, Esq.	"	25	"	"			75
George Hague, Esq.	"	25	"	"			75
T. A. Dawes, Esq.	"	25	"	"			75
S. Carsley, Esq.	"						25
J. Murphy, Esq.	"						25
Total							$1495

8. Subscriptions to Provide Sessional Lecturers, Etc.

Lord Strathcona and Mount Royal, sessions 1891-92 to 1898-99	$42,000
Mrs. John H. R. Molson, sessions 1891-92 to 1899-1900	8,300
Sir Wm. C. Macdonald, to provide for certain salaries in the Department of Physics, etc., sessions 1894-95 and 1895-96	2,627
Total	$52,927

9. Endowments for Apparatus.

The Local Committee of the British Association for the Advancement of Science to found the British Association Apparatus Fund in the Faculties of Arts and Applied Science, in commemoration of the meeting of the Association in Montreal in 1884 .. .. ..

3. Endowments Held in Trust by the Board of Royal Institution.

The "Hannah Willard Lyman Memorial Fund," contributed by subscriptions of former pupils of Miss Lyman, and invested as a permanent endowment to furnish annually a Scholarship or Prizes in a "College for Women" affiliated to the University, or in classes for the Higher Education of Women, approved by the University. The amount of the fund is at present $1,100.

The "Annie McIntosh Prize," contributed by pupils and friends of the late Miss Annie M. McIntosh, of Bute House, Montreal. The income to be given as a prize to women in the Faculty of Arts, $425.

IV. Endowments and Subscriptions for the Faculty of Applied Science.

1. Buildings, Chairs, Etc.

THE WILLIAM SCOTT CHAIR OF CIVIL ENGINEERING, in 1884, endowed by the last will of the late Miss Barbara Scott, of Montreal,—$30,000.

THE THOMAS WORKMAN DEPARTMENT OF MECHANICAL ENGINEERING—founded in 1891 under the last will of the late Thomas Workman, Esq., who bequeathed the sum of $117,000—$60,000 for the maintenance of a Chair of Mechanical Engineering, with the assistance, shops, machinery and apparatus necessary thereto, $57,000 to be expended in provision of necessary buildings, machinery and apparatus.

SIR WILLIAM C. MACDONALD, in 1890, towards erection of Thomas Workman Workshops, $20,000.

THE MACDONALD ENGINEERING BUILDING AND EQUIPMENT—announced by Sir Wm. C. Macdonald as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD PHYSICS BUILDING AND EQUIPMENT in the Faculties of Arts and Applied Science, the gift of Sir William C. Macdonald, announced by him as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD CHAIRS OF PHYSICS, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald,—$120,000.

THE MACDONALD CHAIR OF ELECTRICAL ENGINEERING—endowed by Sir Wm. C. Macdonald, in 1891, with the sum of $40,000; in 1898, with the additional sum of $10,000. Total, $50,000.

THE MACDONALD ENGINEERING BUILDING MAINTENANCE FUND, endowed by Sir Wm. C. Macdonald, in 1892 and 1896.—$85,000.

THE MACDONALD PHYSICS BUILDING MAINTENANCE FUND in the Faculties of Arts and Applied Science, endowed by Sir Wm. C. Macdonald, in 1892 and 1896—$150,000.

THE MACDONALD CHEMISTRY AND MINING BUILDING AND EQUIPMENT, given to the University by Sir William C. Macdonald, in 1896.—$267,141.80.

THE MACDONALD CHEMISTRY AND MINING BUILDING MAINTENANCE FUND, endowed by Sir William C. Macdonald, in 1897 and 1899—$225,000.

THE MACDONALD CHAIR OF MINING AND METALLURGY, endowed in 1896 by Sir William C. Macdonald, with the sum of $50,000.

THE MACDONALD CHAIR OF ARCHITECTURE, endowed in 1896 by Sir Wm. C. Macdonald, with the sum of $50,000.

THE MACDONALD CHAIRS OF CHEMISTRY, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald, with the sum of $110,000.

THE MACDONALD ARCHITECTURAL DEPARTMENT MAINTENANCE FUND, endowed by Sir William C. Macdonald, in 1898.—$10,000.
THE MACDONALD MINING AND METALLURGICAL DEPARTMENT ENDOWMENT FUND, endowed by Sir Wm. C. Macdonald, in 1899.—$55,000.
THE MACDONALD CHEMICAL DEPARTMENT ENDOWMENT FUND, endowed by Sir Wm. C. Macdonald, in 1900.—$135,000.
THE MACDONALD BUILDINGS REPAIR FUND, endowed in 1900 by Sir William C. Macdonald.—$15,000.

2. Endowment for Pension Fund.

This endowment was given in 1894 to be invested and the revenue used exclusively for providing Pensions or Retiring Allowances for members of the teaching staff of the Faculties of Arts and Applied Science.

Lord Strathcona and Mount Royal.$50,000
John H. R. Molson.. 50,000
Sir William C. Macdonald .. .. 50,000—Total, $150,000

3. Exhibitions and Scholarships.

THE SCOTT EXHIBITION.—Founded by the Caledonian Society of Montreal, in commemoration of the Centenary of Sir Walter Scott, and endowed in 1872 with the sum of $1,100 subscribed by members of the Society, and other citizens of Montreal. The Exhibition is given annually in the Faculty of Applied Science—Annual value $50.
THE BURLAND SCHOLARSHIP, founded 1882 by J. H. Burland, B.A.Sc., $100 for a Scholarship in Applied Science for three years, being $300.
HER MAJESTY'S COMMISSION for the Exhibition of 1851—Nomination Scholarships for 1891, 1893, 1895, 1897, 1899 and 1901, value £150 annually, each tenable for two years.
THE DR. T. STERRY HUNT SCHOLARSHIP.—Founded in 1894 by the will of the late Dr. T. Sterry Hunt, and endowed with the sum of $2,082, the income to be given and paid annually to a student or students of Chemistry.
THE CANADIAN GENERAL ELECTRIC CO. SCHOLARSHIPS, given in 1900-1901,—$400.

4. Medals and Prizes.

In 1880 a Gold and a Silver Medal were given by His Excellency the Marquis of Lorne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1883.
In 1884 a Gold and a Silver Medal were given by His Excellency the Marquis of Lansdowne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1888.
In 1885 the British Association Gold Medal for competition in the Graduating class in the Faculty of Applied Science, was founded by subscription of members of the British Association for the Advancement of Science, and by gift of the Council of the Association, in commemoration of its meeting in Montreal in the year 1884.
In 1889 a Gold and a Silver Medal were given by His Excellency Lord Stanley, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1893.
In 1894 a Gold and a Silver Medal were given by His Excellency the Earl of Aberdeen, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1898.

In 1899 a Gold and a Silver Medal were given by His Excellency the Earl of Minto, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued to date.

5. Endowment and Subscriptions for Maintenance of Faculty.

Endowment Fund.		Graduates' Endowment Fund.	
Daniel Torrance, Esq.	$5,000	Graduates' Endowment Fund—	
Charles J. Brydges, Esq.	1,000	Class 1890, $70 a year for 5 years, $350; received to date	$35
R. J. Reekie, Esq.	100		
Total	$6,100		

Annual Subscriptions, 1871-1879.

Hon. James Ferrier ($100 per annum for 10 years)	$ 1,000
Peter Redpath, Esq. ($400 per annum for 10 years)	4,000
John H. R. Molson, Esq. ($400 per annum for 10 years)	4,000
George H. Frothingham, Esq. ($400 per annum for 7 years)	2,800
T. James Claxton, Esq. ($100 per annum for 6 years)	600
Donald Ross, Esq. ($50 per annum for 5 years)	250
Miss Mary Frothingham ($400 per annum for 3 years)	1,200
H. McLennan, Esq. ($100 per annum for 5 years)	500
A. F. Gault, Esq. ($100 per annum for 5 years)	500
Gilbert Scott, Esq. ($100 for 2 years)	200
Joseph Hickson, Esq. ($100 for 2 years)	200
Sir Wm. Dawson ($300 for 2 years)	600
His Excellency the Marquis of Lorne	500
Mrs. Redpath (Terrace Bank)	100
Total	$16,450

Subscriptions towards Maintenance of Engineering Department.

Sir Wm. C. Macdonald,	sessions 1891-92 to 1897-98	$56,341
do	for advertising	675
do	to cover certain salaries, session 1894-95 and 1897-98	1,920
do	to meet the expenses of the course of summer work for Mining Engineering Students (1898)	825
do	Electric Light Re-installation in Engineering Building, 1899	6,000
do	to cover salary of Assistant in Chemical Department, session 1898-99 and session 1899-1900	1,000
do	Electric Storage Batteries, Reinstallation of Electric Lighting in Physics Building, etc., 1901	30,000
A Friend, towards maintenance of Electrical Engineering Department, 1901		400
Total		$97,161

Subscriptions to Provide Lectures in Mechanical and Sanitary Engineering.

E. B. Greenshields, Esq.	$ 50	Forward	$161
J. E. Bovey, Esq.	50	Jeffrey H. Burland, B.A.Sc., $100 for 2 years.	200
Professor H. T. Bovey	61	Smaller amounts	40
Forward	$161	Total	$401

Subscriptions for Maintenance of Chair of Practical Chemistry, 1862.

Hon. C. Dunkin, M.P.	$1,200
Sir William Dawson	1,200
Peter Redpath, Esq.	226
Total	$2,626

For Maintenance of Chair of Mining Engineering and Metallurgy, 1891.

R. B. Angus, Esq.	$2000	
Mrs. Dow	1000	
Hugh McLennan, Esq.	1000	
Miss Benny	1000	
T. A. Dawes, Esq.	750	
A. A. Ayer, Esq.	250	
G. W. Reid, Esq.	100	
Evans Bros.	100	
		$ 6,200
Payable in Three Years.		
Sir W. Dawson	1000	
Alex. Stuart, Esq. (London, Eng.)	1500	
R. G. Reid, Esq.	1500	
Forward	$4,000	$6,200
Forward	$4,000	$6,200
E. K. Greene, Esq.	750	
Dr. T. Brainerd	750	
A. F. Gault, Esq.	750	
Messrs. H. & A. Allan	750	
Hector Mackenzie, Esq.	750	
Peter Lyall, Esq.	750	
James Ross, Esq.	600	
A. Robertson, Esq.	300	
John Duncan, Esq.	300	
George Hague, Esq.	300	
Jonathan Hodgson, Esq.	300	
James Moore, Esq.	200	
Messrs. Ames & Holden	150	
James Cooper, Esq.	150	
		10,800
Total		$17,000

Remodelling East Wing for Class Rooms for Faculty of Applied Science, 1888.

John H. R. Molson, Esq.	$3,000
Sir Wm. C. Macdonald	3,000
Total	$6,000

6. Endowments for Apparatus.

The Local Committee of the British Association for the Advancement of Science, to found the British Association Apparatus Fund in the Faculties of Arts and Applied Science, in commemoration of the meeting of the Association in Montreal in 1884 ..... $1,500

7. Subscriptions, Etc., for Apparatus.

A lady, for the purchase of Mining Models	$1,000
Thos. McDougall, Esq., for the same	25
J. Livesey, Esq., through Dr. Harrington, for the same	50
Geo. Stephen, Esq., for the same	50
Chas. Gibb, Esq., donation for Apparatus in Applied Science	50
The Local Committee for the reception (1881) of American Society of Civil Engineers for the purchase of Appliances for the department of Civil Engineering in Faculty of Applied Science	475
Capt. Adams, Chemical Apparatus	10
J. H. Burland, B.A.Sc., Chemical Apparatus	25
Sir Wm. C. Macdonald—	
For Surveying and Geodetic Apparatus in 1890	1,500
For new apparatus, etc., in the Mechanical Department, 1900	5,000
Total	$8,185

8. List of Subscribers and Donors to the Equipment of the New Engineering Buildings of McGill University to May, 1900.

Abbott W..... .....Equipment
Adams, Capt. R. C.....
Mining Photographs
American Locomotive Co.....
Drawings
American Bridge Co...Drawings
American Steam Gauge Co. (Boston) ..... Indicator
Archbald, H. .....Books
Ashton Valve Co. (Boston).....
Sectional Valve
Aurora Metal Co.....Specimens
Bell Telephone Co.....
Telephone Apparatus
Bertram & Sons, J. (Dundas)....
24 in. Planer
Bethlehem Iron Co....Specimens
Birch & Co., J. (England).....
Hydraulic Tubes
Birks, Henry ..... Clock
Bishop, George .....Equipment
Blackwell, Kennet....Equipment
Blake Mnfg. Co., The George F.
Blue Prints of Pump
Blake Pump Co., The Geo. (New York & Boston).....Pump
Bluenose Mining Co.....Ore
Bremner, A. $50
Brockhaus, Herr F. A.....Books
Brodie & Harvey.....$50
Brunner, Mond & Co.....Ore
Brush, G. .....Boiler
Cameron, General.. Rotary Drill
Campbell Tile Co. (England), per Jordan & Locker.....
Equipment
Campbell, Kenneth. $50
Canada Switch Co.....Castings
Canadian General Electric Co. (Toronto), per F. Nicholls.....
Equipment
Canada General Electric Co.....
Electric Drill, Edison Generator, Dynamo, Motor
Canada Rand Drill Co.....
Rock Drill
Carnegie Steel Co.....Specimens
Carsley, S. $100
Carus-Wilson, Prof. C. A.....
Equipment
Cary, A. A.....
Photographs of Boilers
Chadwick, F.....Truss Models
Chanteloup, E. $50
Claxton, T. J..Timber Beams of large Scantling for Testing Laboratory
Costigan, J. ..... Equipment
Cowen, Amos..Samples of Bricks
Cowper, P. H. .....
Model of Steam Engine
Craig, Messrs. J. & M. (Kilmarnock, Scotland)..Sanitary Sections (full size) and models
Crocker-Wheeler Electric Motor Co., The (New York)....Motor Armature, Prints
Crosby Steam Gauge and Valve Co., The (Boston)—Gauge and Valve, Indicator and Valves
Cumberland Ry. and Coal Co.Ore
Darling, Brown & Sharpe (Providence, R.I.).....6 in. Rule
Date, John .....Equipment
Dawson, W. B.....
Books and Specimens
Dolworth Mining Co...5 tons ore
Dominion Coal Co..Miners' Tools
Dominion Wire Manfg. Co., per F. Fairman .....Shaper
Douglas, James .....Ore
Drummond, Hon. G. A.....Prism
Drummond, G. E.....Ore
Drysdale, D. .....Tools
Drysdale, W. .....Tools
Earle, S. R.....Air Injector
Edison General Electric Co.....
Two 450 light dynamos, Brake Shoe and Disc
Egleston, Dr. (New York).....
Framed Photograph of the Moon, Books, Photos, etc.
Electric Welding Company (Boston) ..... Equipment
"Engineering Magazine" (New York City) Mining Illustrations and Photographs
Eureka Tempered Copper Co....
Equipment
Eustis Mining Co.....12 tons ore
Ewan, A. $100
Felton & Guilleaume.....
Samples of Cable Wire, etc.
Forsyth, R. .....Equipment
Frothingham & Workman..Tools
Furlong, G. W., B.A.Sc.....
Specimens of Pine and Wood bored by Teredos
Gardner, & Son, R. W.....
16 in Lathe
Gardner, R. .....Equipment
Garth & Co. $500
Garth, Henry .....Equipment
Girldestone, J. .....Plans

Government of New South Wales Collection of Australian Timbers
Government of Queensland, Australia..Collection of Queensland Timbers
Gower, W. E.....
Graham, H. $100
Grier, G. A. .....Equipment
Guggenheim Smelting Co..... Specimens
Gurney & Co., E. & C.....$604
Hadfield, Messrs. (Sheffield)..... Equipment
Hamilton Bridge Works Co..... A Model of the Stoney Creek Arch
Hamilton Powder Co., Electrical Blasting Machine, and Appliances, etc., for blasting.
Hearn & Harrison, per L. Harrison.....Barometer & Clock
Hersey, R. $1200
Hodgson, Jonathan $200
Holden, A. .....Equipment
Hosoki, Dr., of Tokio, Japan.... Collection of Japanese Wood
Hoyt Metal Co.....Specimens
Hughes & Stephenson.Equipment
Hutton, W. H. .....Equipment
Illinois Steel Co.....Photos, etc.
Ingersoll Rock Drill Co..... Rock Drill
Irwin & Hopper.....Equipment
Ives, H. R. .....Cupola
Joyce, Alfred. $50
Jordan & Locker.....Equipment
Kennedy, John .....Equipment
Kennedy, W. & Sons..... American Turbine
Kennedy, W. (Owen Sound)..... Pump
Kerr, R. & W.....Tools
King & Son, Warden.....$534
Laughlin-Hough Drawing Table Co. .....Drawing Tables
Lachine Rapids Co..... Electrical apparatus and power
Laurie & Bro., J..... Compound Engine
Lawson, A. J. .....Equipment
Lehigh Zinc & Iron Co..Franklin Furnace, N. J., Mining Specimens and Photographs.
Lindsay & Co., C. F..Equipment
Lovell & Son, John.....Books
Lyster, A. G.....Drawings and Sketches of London and Liverpool Docks.
McPherson, A. .....Tools
Mason, Dr. .....Equipment
Maxwell & Co., E. J...Equipment
McCarthy, D. & J. (Sorel)....$300
M. Dougall, Mrs. J.....$4000
McLachlin Bros. (Arnprior)..... Timber
McLaren, D. $100
McLaughlin Bros. .....Timber
McNally & Co., W.....$100
McPherson Sand Box Co. (Troy, N. Y.) .....Model of sand Box
Midvale Steel Co.....Specimens
Miller Bros. & Sons.....Elevator
Mitchell, P.....Equipment ($300)
Mitchell & Co., R.....Equipment
Naismith, P. L., B.A.Sc..... Specimens
Nalder Bros. & Co. (England).... Standard Cell
National Electric Mfg. Co....100 volt Transformer, Transformers
National Lead Co.....Specimens.
Nicholson, Peter. $100
Norton A. O., Boston, Mass. Two Norton Bull-bearing Lifting-Jacks.
Norton Emery Wheel Co. (Worcester, U.S.) .....Equipment
Notman, Wm. .....Photographs
Ohio Brass Co.....Fittings
Ogilvie, W. $500
Ontario Graphite Co..... Graphite Rock
Packard Elec. Co..Transformers
Palmer, A. .....Equipment
Parker, M. .....Equipment
Paton, H. .....Equipment
Peckham Motor Truck And Wheel Co. (Kingston, N.Y.).... Model of Motor Truck
Pelton Water Wheel Co. (New York) .....Two Motors
Pennsylvania Railroad Co..... Working Drawings of Locomotives (32)
Perrin & Co., W. R..... Press and force pump
Phelps Engine Co., per A. R. Williams & Co., Dake Steam Engine, 4 Horse Power Engine
Pillow, J. A.,.....$250
Pittsburgh Reduction Co..... Specimens
Pratt & Whitney (Hartford Conn.),Epicycloidal Gear Model
Prowse, G. R.....Equipment
Queensland Government, per Sir Thos. McIlwraith..Collection of Timbers.
Radiator Co. (Toronto).....$500
Ramsay & Son, A.....$100
Rathbun E. W.....Samples of Fire-proof Construction ($112)
Reddaway & Co., F..... Belt (value $50)

Redpath, F. R.....Equipment
Redpath, Mrs. $100
Reed, G. W.....$100
Reford, R. $1000
Reid, R. .....Equipment
Reid, R. G.....$1000
Renouf, E. M.....Books
Rhode Island Locomotive Works
Photos of Locomotives
Rife's Hydraulic Engine Mfg. Co. (Roanoke, Va., U.S.A.).....
Hydraulic Ram
Robb & Armstrong.....
80 H.P. High Speed Engine
Robertson, J. .....Equipment
Rogers, Professor (Waterville, Maine) ..... Equipment
Ross, Jas. $500
Rodden, W. .....Equipment
Royal Electric Co.....Motors, Dynamos, Transformers, Coils, Condensers
Rutherford, W. .....Equipment
Sadler, G. (Robin & Sadler).....
Belting ($400)
Seeley, John .....Insulators
Schaeffer & Budenbery (Brooklyn, N.Y.)....Double Indicator
Scholes, F. $100
Scovill Mfg. Co.....Equipment
Sharp, Stewart & Co. (Manchester, Eng.) .....Equipment
Shearer, James $200
Sheppard, Chas. $200
Siemens Bros. (London, Eng.)...
Cable Samples
Smith, C. B. .....
Framed Photos of Bridges (2)
Smith, R. .....Equipment
Spence, J. P., C.E..Specifications and drawings, showing construction of Sault Ste. Marie Canal Locks.
Smith, R. Guilford.....Books
Stanley Elect. Co....Wattmeter
Steel Co. of Scotland, The.....
Samples of Cable Wire, etc.
St. George, P. W.....Models
Stirling Co., The..Sectional Blue Prints of Boilers
Sturtevant Co., The B. P. (Boston) ..... Blowers
Swan Lamp Mfg. Co.....Lamps
Taylor, A. T. $300
Tees & Co.....Equipment
Thomas, R. & Son.....Insulators
Thomson-Houston Co. (Boston). Incandescent Dynamos
Twyford & Co.....Equipment
U. S. Navy Const. Dept.....
Drawings, etc.
Vail, Stephen.....Piece of first Telegraph Wire Used
Walker & Co., James.....Tools
Wanklyn, F. L.....Equipment
Ward, Hon. J. K.....$50
Warrington Wire Co.....
Cable Samples
Waterous Engine Co.....—.....
Drawings, etc.
Westinghouse Air Brake Co.....
) Drawings, etc.
Weston Elect. Instr. Co.....
Ammeters &c.
Wetherill Separating Co.....
Ore samples
Whittier Machine Co. (Boston)..
Electric Elevator
Wiley & Sons, John (New York)
Books
Yale & Towne Mfg. Co. (Stamford, Conn.) .....Equipment
Yates & Thom.....
Blue Prints of Machinery

The above representing a total of about $80,000.

9. Faculty of Applied Science Library Endowment, 1893.

Hugh Paton.. .. ..$ 25	Forward.. .. ..$600
A. Joyce.. 25	W. Rodden.. 25
R. Gardner.. 50	M. Parker.. 25
H. Garth.. 100	Robin & Sadler.. 50
Hughes & Stephenson.. 100	J. Robertson, Esq.. 50
R. Mitchell 300	Mrs. John McDougall (1895).. 20
Forward.. .. ..$600	Total.. .. ..$770

V Endowments and Subscriptions in Aid of the Faculty of Medicine.

1. Leanchoil Endowment, 1884.

Lord Strathcona and Mount Royal $50,000

2. Campbell Memorial Endowment, 1884.

Established to commemorate the service rendered to the Faculty during 40 years by the late Dean, George W. Campbell, M.D., LL.D.

Mrs. G. W. Campbell. .. ..$	2000
H. A. Allan, Esq.	1500
Lord Strathcona and Mount Royal	1500
Lord Mount Stephen..	1000
R. B. Angus, Esq...	1000
Hon. Geo. A. Drummond ..	1000
Alex. Murray, Esq.	1000
Robert Moat, Esq.	1000
Sir W. C. Macdonald	1000
A Friend	1000
Duncan McIntyre, Esq... ..	1000
A. F. Gault, Esq.	1000
M. H. Gault, Esq.	1000
G. W. Stephens, Esq...	1000
James Benning, Esq..	1000
R. P. Howard, M.D.	1000
G. B. & J. H. Burland, Esqs.	1000
Miss Elizabeth C. Benny ..	1000
J. C. Wilson, Esq...	1000
Mrs. John Redpath	1000
Hon. John Hamilton	1000
Miss Orkney	1000
Hugh Mackay, Esq.	1000
Hector Mackenzie, Esq... ..	1000
Thomas Workman, Esq. ..	1000
Hugh McLennan, Esq.	1000
O. S. Wood, Esq.	1000
Frank Buller, M.D.	500
James Burnett, Esq.	500
Andrew Robertson, Esq.. ..	500
Robert Mackay, Esq.	500
John Hope, Esq.	500
Alex. Urquhart, Esq...	500
R. A. Smith, Esq.	500
George Hague, Esq.	500
J. K. Ward, Esq.	500
Warden King, Esq.	500
John Stirling, Esq.	500
John Rankin ,Esq.	500
Robert Reford, Esq.	500
Messrs. Cantlie, Ewan & Co.	500
Messrs. J. & W. Ogilvie ..	500
Randolph Hersey, Esq.	500
John A. Pillow, Esq.	500
S. Carsley, Esq.	500
D. C. MacCallum, M.D... ..	500
Messrs. S. Greenshields, Son & Co.	500
Forward .. ..$	39,000

Forward .. ..$	39,000
Jonathan Hodgson, Esq.. ..	500
George Ross, M.D.	500
T. G. Roddick, M.D.	500
Wm. Gardner, M.D.	500
Messrs. Cochrane, Cassils & Co.	500
Sir Joseph Hickson	500
Allan Gilmour, Esq., Ottawa	500
R. W. Shepherd, Esq.	500
G. E. Fenwick, M.D.	300
Miles Williams, Esq.	300
G. P. Girdwood, M.D.	250
Charles F. Smithers, Esq. ..	250
John Kerry, Esq.	250
A. Baumgarten, Esq...	250
R. W. Elmenhorst, Esq... ..	250
W. F. Lewis, Esq.	250
George Armstrong, Esq. ..	250
J. M. Douglas, Esq.	250
Messrs. H. Lyman Sons & Co.	250
F. J. Shepherd, M.D.	250
Duncan McEachran, Esq., F.R.C.V.S.	200
Benj. Dawson, Esq.	200
R. Wolff, Esq.	150
James Stuart, M.D.	150
A. T. Paterson, Esq.	100
H. W. Thornton, M.D. (New Richmond, Q.)	100
C. B. Harvey, M.D. (Yale, B.C.)	100
D. Cluness, M.D. (Nanaimo, B.C.)	100
W. Kinlock, Esq.	100
Hua, Richardson & Co.	100
Mrs. Cuthbert (N. Richmond, Q.)	100
J. M. Drake, M.D.	100
Hugh Patton, Esq.	100
R. T. Godfrey, M. D.	100
T. A. Rodger, M.D.	100
W. A. Dyer, Esq...	100
Geo. W. Wood, M.D. (Faribault, Minn.)	100
A. A. Browne, M.D.	100
Geo. Wilkins, M.D.	100
R. L. MacDonnell, M.D. ..	100
Forward .. ..$	48,400

Forward	$48,400
Jos. Workman, M.D. (Toronto)	50
Henry Lunam, B.A., M.D. (Campbellton, N.B.).	50
Hon. Sir A. T. Galt	50
R. J. Alloway, M.D.	30
R. J. B. Howard, M.D.	25
Louis T. Marceau, M.D. (Napierville, Q.)..	25
Griffith Evans, M.D. (Vet. Dept. Army)..	26
J. J. Farley, M.D. (Belleville)	25
Henry R. Gray, Esq...	25
J. E. Brouse, M.D. (Prescott)	20
R. N. Rinfret (Quebec) ..	20
Robert Howard, M.D. (St. Johns)	20
Drs. J. & D. McIntosh Vankleek Hill)	20
J. H. McBean, M.D.	15
J. C. Rattray, M.D. (Cobden, O.)	10
E. H. Howard, M.D. (Lachine)	10
Forward	$48,821
J. W. Oliver, M.D. (Clifton, O.)	10
D. A. McDougall, M.D. (Ottawa, O.)	10
A. Poussette, M.D. (Sarnia, O.)	10
A. Ruttan, M.D. (Napanee, O.)	10
James Gunn, M.D. (Dunham, O.)	10
J. McDiarmid, M.D. (Hensall, O.)	5
W. J. Derby, M.D. (Rockland, O.)	5
J. Gillies, M.D. (Teeswater, O.)	5
J. B. Benson, M.D. (Chatham, N.B.)	5
L. A. Fortier, M.D. (St. David, Q.)	5
J. A. McArthur, M.D. (Fort Elgin, O.)..	5
John Campbell, M.D. (Seaforth, O.)	5
Total	$48,906

3. Endowed Chairs, Donations, Etc.

LORD STRATHCONA AND MOUNT ROYAL CHAIR OF PATHOLOGY, endowed in 1893 by Lord Strathcona and Mount Royal with the sum of $50,000

LORD STRATHCONA AND MOUNT ROYAL ENDOWMENT FOR THE DEPARTMENT OF HYGIENE, endowed in 1893 by Lord Strathcona and Mount Royal with a sum of 50,000

MRS. MARY DOW BEQUEST—Bequest by the will of the late Mrs. Mary Dow for the Faculty of Medicine, 1893, $10,000 less Government Tax of 10 per cent. 9,000

JOHN H. R. MOLSON DONATION—in 1893, $25,000 for the purchase of land and $35,000 for additional building and equipment.. 60,000

WALTER DRAKE, ESQ., for benefit of Chair of Physiology, an annual donation of $500 given 1891 to 1897 3,500

DR. ROBERT CRAIK FUND—

Mrs. John McDougall, toward formation of above (1893-94)	$1,000	
Jane F. Learmont, bequest, do. do. (1894)..	3,000	
		4,000

JOSEPH MORLEY DRAKE CHAIR OF PHYSIOLOGY, endowed in 1898 by Walter Drake, Esq., with the sum of 25,000

LADY STRATHCONA AND MOUNT ROYAL Donation for erection and equipment Additional Buildings (1899). 50,000

HON. MRS. HOWARD Donation for erection and equipment Additional Buildings (1899) 50,000

D. MORRICE, ESQ., Donation for equipment of Pharmacology Laboratories 1,500

4. Medals and Scholarships.

In 1865 the "Holmes Gold Medal" was founded by the Faculty of Medicine as a memorial of the late Andrew Holmes, Esq., M.D., LL.D., late Dean of the Faculty of Medicine, to be given to the best student in the graduating class in Medicine, who should undergo a special examination in all the branches whether Primary or Final.

In 1878 the "Sutherland Gold Medal" was founded by Mrs. Sutherland of Montreal, in memory of her late husband, Prof. William Sutherland, M.D., for competition in the classes of Theoretical and Practical Chemistry in the Faculty of Medicine, together with creditable standing in the Primary Examinations.

THE DAVID MORRICE SCHOLARSHIP—in the subject of Institutes of Medicine, in the Faculty of Medicine—founded in 1881—value $100. (Terminated in 1883.)

5. Library, Museum and Apparatus.

For the Fittings of the Library and Museum of the Faculty of Medicine, 1872.

G. W. Campbell, A.M. M.D.	$1200	Forward	$2,000
W. E. Scott, M.D.	200	Robert Craik, M.D.	200
Wm. Wright, M.D.	200	Geo. E. Fenwick, M.D.	200
Robert P. Howard, M.D.	200	Joseph M. Drake, M.D.	200
Duncan C. MacCallum, M.D.	200	George Ross, M.A., M.D.	50
Forward	$2,000	Total	$2,650

The Professors and Lecturers in the Summer Sessions of the Faculty of Medicine..... Donation to Apparatus, Museum Library, etc., of the Medical Faculty, 1887, $1,182; 1888, $1.023. $2,205

For Physiological Labora ory of Faculty of Medicine, 1879.

Dr. Campbell	$100	Forward	$700
Dr. Howard	100	Dr. Ross	50
Dr. Craik	100	Dr. Roddick	50
Dr. MacCallum	100	Dr. Buller	50
Dr. Drake	100	Dr. Gardner	50
Dr. Godfrey	100	Dr. Osler	50
Dr. McEachran, F.R.C.V.S.	100		
Forward	$700	Total	$950

Cameron Obstetric Collections.

Dr. J. C. Cameron $10,000

6. Miscellaneous.

Anonymous Donor toward Expenses of Pathology for Session 1892-93 ..... $500

Contributors Towards Salary of Research Fellow in the Department of Pathology, 1900.

James Ross, Esq.	$2,500
R. B. Angus, Esq.	2,500
Total	$5,000

VI. Endowments and Subscriptions for the Faculty of Law.

1. Endowed Chairs, Etc.

THE GALE CHAIR, in the Faculty of Law, endowed in 1884 by the late Mrs. Andrew Stuart (*née* Agnes Logan Gale), of Montreal, in memory of her father, the late Hon. Mr. Justice Gale.—$25,000.

THE MACDONALD FACULTY OF LAW ENDOWMENT, founded by Sir Wm. C. Macdonald, in 1890—$150,000. Supplemented in 1897 by $50,000. Total $200,000.

SIR WM. C. MACDONALD, remodelling part of East Wing in 1895 for Class Rooms, Lecture Rooms, etc., for Law Faculty.

SIR WM. C. MACDONALD, travelling scholarships in Law, 1901,—$3,600.

2. Medal.

In 1865 the "Elizabeth Torrance Gold Medal," was founded and endowed by John Torrance, Esq., of St. Antoine Hall, Montreal, in memory of the late Mrs. John Torrance, for the best student in the graduating class in Law, and more especially for the highest proficiency in Roman Law.

VII. Graduates' Funds.

1. The Fund for Endowment of the Library.

The Graduates' Society of the University, in 1876, passed the following Resolution :—

Resolved :—"That the members and graduates be invited to subscribe to a fund for the endowment of the Libraries of the University; said fund to be invested and the proceeds applied under the supervision of the Council of the Society in annual additions to the Libraries; an equitable division of said proceeds to be made by the Council between the University Library and those of the Professional Faculties."

In terms thereof subscriptions have been paid in to the Graduates' Society, amounting in all to $3,120; the interest on which is annually expended in the purchase of books for the several libraries, under the direction of a special committee appointed for that purpose.

2. The Dawson Fellowship Foundation.

The Graduates' Society of the University, in 1880, and in commemoration of the completion by Dr. Dawson of his twenty-fifth year as Principal, resolved to raise, with the assistance of their friends, a fund towards the Endowment of the Fellowship under the above name.

Details of the scheme can be had from the Treasurer, Francis Topp, B.A., B.C.L. The following subscriptions have been announced to date, Jan. 1st, 1902. They are payable in one sum, in instalments, without interest or with interest till payment of capital as subscribers have elected.

Alphabetically arranged.

Abbott, H., B.C.L.	$ 60
Archibald, H., B.A.Sc.	20
Bethune, M. B., M.A., B.C.L.	50
Carter, C. B., B.C.L.	100
Cruikshank, W. G., B.C.L.	100
Dawson, W. B., M.A., Ma.E.	50
Dougall, J. R., M.A.	250
Gibb, C., B.A.	100
Hall, Rev. Wm., M.A.	100
Hall, J. S., jun., B.A., B.C.L.	100
Harrington, B. J., B.A., Ph.D.	50
Hutchinson, M., B.C.L.	400
Kirby, J., LL.D., D.C.L.	50
Krans, Rev. E. H., M.A., LL.D.	100
Leet, S. P., B.C.L.	100
Lighthall, W. D., M.A., B.C.L.	100
Forward	$1,730
Lyman, H. H., M.A.	100
Lyman, A. C., M.A., B.C.L.	50
McCormick, D., B.C.L.	100
McGibbon, R. D., B.A., B.C.L.	100
McGoun, A., jun., M.A., B.C.L.	50
McLennan, J. S., B.A.	100
Ramsay, R. A., M.A., B.C.L.	50
Spencer, J. W., B.A.Sc., Ph.D.	50
Stephen, C. H., B.C.L.	100
Stewart, D. A., B.A.Sc.	20
Stewart, J., M.D.	60
Tait, M. M., B.C.L.	100
Taylor, A. D., B.A., B.C.L.	100
Trenholme, N. W., M.A., D.C.L.	40
Total to date	$3,110

McGill University.

SESSION 1901-1902.

DEGREE AND SESSIONAL EXAMINATIONS.

LISTS OF STANDING, HONOURS AND PRIZES.

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SESSION 1901-1902.

Faculty of Law.

THIRD YEAR (GRADUATING CLASS).

HONOURS.

(In order of merit. Students of equal standing are bracketed together.)

WAINWRIGHT, A., B.A.—First Rank Honours, Elizabeth Torrance, Gold Medal and Prize of $40.
ASTLE, T. F.—First Rank Honours and Prize of $40.
COTTON, C. M., B.A.—First Rank Honours and Prize of $15.
GARIEPY, W., B.A.—First Rank Honours and Prize of $15.

PASSED FOR THE DEGREE OF B.C.L.

(In order of merit.)

Wainwright, A., B.A.
Astle, T. F.
Cotton, C. M., B.A.
Gariepy, W., B.A.
Duff, A. H., B.A.
Brown, E. N., B.A.
Couper, W. M.
Aylmer, H. U. P.
Ogden, C. G., *ægrotat.*

ADMITTED TO THE DEGREE OF D.C.L.

(In course.)

William John White, M.A., B.C.L.

STANDING IN THE SEVERAL SUBJECTS.

(Subjects alphabetically arranged.)

COMMERCIAL LAW.

Wainwright, Astle, Cotton, Duff, Brown, Gariépy, Aylmer, Couper.

CONSTITUTIONAL LAW.

Wainwright, Duff, Astle, Cotton, Gariépy, Aylmer, Brown, Couper.

CRIMINAL LAW.

Couper, Wainwright, Gariépy and Astle, equal; Cotton, Brown, Aylmer, Duff.

HISTORY OF LAW, CORPORATIONS AND PARTNERSHIP.

Wainwright; Gariépy and Cotton, equal; Astle, Brown, Couper, Aylmer, Duff.

INTERNATIONAL LAW.

Wainwright, Duff, Gariépy, Cotton, Astle and Aylmer, equal; Brown, Couper.

MARRIAGE COVENANTS, PRESCRIPTION, ETC.

Wainwright, Astle, Cotton, Brown, Gariépy, Aylmer, Couper, Duff.

OBLIGATIONS.

Wainwright, Astle, Cotton and Gariépy, equal; Brown, Aylmer and Duff, equal; Couper.

PROCEDURE.

Couper; Astle and Wainwright, equal; Cotton, Gariépy, Duff, Brown, Aylmer.

REAL PROPERTY LAW.

Wainwright, Astle, Duff, Gariépy, Cotton, Couper, Brown and Aylmer, equal.

ROMAN LAW.

Wainwright, Astle, Cotton, Duff, Aylmer and Gariépy, equal; Brown, Couper.

SUCCESSIONS, GIFTS AND SUBSTITUTIONS.

Wainwright, Brown, Cotton, Gariépy, Duff, Astle, Couper, Aylmer.

SECOND YEAR.

HONOURS.

(In order of merit.)

RUGG, F. S.—First Rank General Standing and Prize of $50.
GOSSELIN, L., B.A.—First Rank General Standing and Prize of $25.

PASSED THE SESSIONAL EXAMINATIONS.

(In order of merit.)

Rugg, Gosselin, Madore, Blaylock, Bergeron, Mackinnon, Théberge, Tansey, Casgrain, Weinfield, Orr, Angus, Rankin, Vipond.

STANDING IN THE SEVERAL SUBJECTS.

(Subjects alphabetically arranged.)

AGENCY AND PARTNERSHIP.

Vipond, Tansey; Madore, Bergeron and Weinfield, equal; Rugg, Casgrain, Gosselin, Théberge, Blaylock, Mackinnon.

CIVIL PROCEDURE.

Mackinnon, Rugg; Bergeron and Weinfield, equal; Théberge and Tansey, equal; Gosselin, Blaylock and Casgrain, equal; Angus; Madore and Orr, equal.

COMMERCIAL LAW.

Rugg, Blaylock, Bergeron and Gosselin, equal; Madore and Mackinnon, equal; Tansey; Casgrain, Théberge and Weinfield, equal; Orr, Angus, Rankin.

CRIMINAL LAW.

Gosselin and Rugg, equal; Mackinnon, Blaylock and Weinfield, equal; Bergeron, Madore, Théberge, Angus and Orr, equal; Casgrain.

INTERNATIONAL LAW.

Vipond, Madore, Blaylock, Théberge, Bergeron and Gosselin, equal; Tansey, Mackinnon, Rugg, Rankin, Orr.

MARRIAGE COVENANTS, ETC.

Madore, Gosselin, Rugg, Blaylock, Orr, Bergeron, Théberge, Mackinnon, Casgrain, Tansey, Weinfield.

REAL PROPERTY LAW.

Gosselin, Madore, Vipond; Rugg, Blaylock and Tansey, equal; Mackinnon, Théberge, Casgrain, Bergeron and Rankin, equal; Orr, Weinfield and Angus, equal.

SUBSTITUTIONS, GIFTS, ETC.

Gosselin, Bergeron, Mackinnon, Madore, Blaylock, Orr, Angus; Rugg and Tansey, equal; Casgrain, Théberge, Weinfield, Rankin.

FIRST YEAR.

HONOURS.

(In order of merit.)

DICKSON, NORVAL, B.A.—First Rank General Standing and Scholarship of $100; Special Prize in Roman Law.
COTTON, W. U., B.A.—First Rank General Standing and Scholarship of $100; Special Prize in Roman Law.

PASSED THE SESSIONAL EXAMINATIONS.

(In order of merit.)

Dickson, Cotton, Williams, Drouin, Ogilvie, Brodie, Vineberg, De Witt, MacDougall, Phelan, Chipman, Stephens, Ker, McGregor, Mackie.

STANDING IN THE SEVERAL SUBJECTS.

(Subjects alphabetically arranged.)

CIVIL PROCEDURE.

Drouin, Williams, Dickson, Cotton, Brodie and Ogilvie, equal; De Witt, Ker, Phelan, Mackie, Vineberg, Stephens, McDougall, Pope.

CONSTITUTIONAL LAW.

Brodie, Williams, Cotton and Dickson, equal; Ogilvie, Vineberg and McDougall, equal; Drouin, Chipman, Phelan, Ker, Stephens, Macgregor and De Witt, equal.

LEGAL HISTORY.

Dickson, McDougall and Ogilvie, equal; Drouin, Williams, Brodie, Cotton, Phelan and De Witt equal; Friedlander, Macgregor and Stephens, equal; Ker, Vineberg.

OBLIGATIONS.

Dickson, Cotton, Williams, Drouin, Vineberg, Brodie, Chipman, Phelan, Macgregor, De Witt, McDougall, Stephens, Ker, Pope.

PERSONS.

Dickson, Cotton, Williams, Stephens, Drouin, McDougall and Ker, equal; Phelan, De Witt and Vineberg, equal; Brodie and Ogilvie, equal; Pope, Chipman, Macgregor, Mackie.

REAL RIGHTS.

Dickson, Williams, Cotton, Drouin, Ogilvie, Ker and Macgregor, equal; Brodie, Vineberg, De Witt, Phelan, Chipman, Stephens.

ROMAN LAW.

Cotton, Dickson, Williams, Drouin, Ogilvie, Vineberg, De Witt, McDougall, Brodie, Chipman, Phelan, Stephens.

Faculty of Arts.

PASSED FOR THE DEGREE OF B.A.

IN HONOURS.

(In Alphabetical Order.)

First Rank.—Dixon, Jennie D.
Munn, W. Clement.
Nolan, Annie W.

Second Rank.—Adams, Chauncey A.
Bickerdike, May C.
Clogg, Vivian E.
Irving, Elizabeth.
Munn, Emma M.
Warriner, J. Eva.

ORDINARY B.A.

(In order of merit. Students of equal standing are bracketed together.)

Class I.—Crowell, Sam. G.
Harris, Spencer
Plant, Verner L.
Jack, Milton
[Reid, Allan S.
[Brodie, Hugh H.

Class II.—Pruyn, Wm. G.
Blagrave, Robt. C.
Smith, Miriam.
McDonald, John A.
Carson, Hermon A.
Irving, Geo.
Cole, G. Edwards.
Walker, John J.

Class III.—Crothers, Harold R.
Day, Daisy.
Greenleese, Mary S.

(In Alphabetical Order.)

Boulter, Jas. Hy.
Brown, Albert Victor.
Mount, Hector P.
Scott, Wm. Jas.
White, D. Roderick.

Aegrotat.—Hitchcock, Caroline L.

STUDENT IN ARTS REGISTERED IN THE MEDICAL FACULTY WHO WILL BE QUALIFIED TO OBTAIN THE DEGREE OF B.A., IN JUNE, 1902, ON COMPLETING HIS MEDICAL YEAR.

Murphy, Herbert H.

BACHELOR OF SCIENCE ADMITTED "AD EUNDEM GRADUM."

McIntosh, Douglas.

BACHELORS OF ARTS PROCEEDING TO THE DEGREE OF M.A. IN COURSE.

Rexford, Elson I.
Munn, D. Walter.
Rorke, Helen.
Woodley, Edward C.
Millar, Wm. Kinloch.

BACHELORS OF ARTS PROCEEDING TO THE DEGREE OF M.SC. IN COURSE.

Reid, Lena McK.
McIntosh, Douglas.

PASSED THE INTERMEDIATE EXAMINATION.

(1).—FOR COURSE LEADING TO B.A.

(In order of merit. Students of equal standing are bracketed together.)

Class I.—Rose, Herbert J.
Archibald, John G.
Sheldon, Ernest W.
Lomer, Theodore A.
Simpson, Edith P.

Class II.—Hart, E. Muriel.
Mackenzie, Catherine I.
Hindley, J. George.
McKenzie, Angus D. M.
Lathe, Frank E.
Shanks, George.
Dickson, Ada D.
Brown, William Gordon.
Griffin, Grace L.
Gurd, Fraser B.
McGougan, Edward.
McCallum, Orrick B.
Rubinowitz, Israel F.
Wickware, Francis G.
Campbell, D. Grant.
McDonald, George C.
Mingie, George W.
Papineau, Talbot M.

Class III. Freeze, Helen L.
McCally, M. Kathleen.
Henry, A. O. Edna.
MacLeod, Annie L.
Marshall, William W.
Draper, Madolin A.
Gardner, Helen Ivy L.
Chandler, Arthur B.
Wilson, Alice M.
Robertson, Ethel C.
Stewart, Lilian J.
Craig, Bessie.
MacMillen, Hy. Hind.
Bell, Ruth.
Bouchard, Myra McL. (*s*)
*Findlay, Delmer C. (*s*).
Logan, David C. (*s*).
McDiarmid, James S. (*s*).
MacFarlane, Chas. M. (*s*).
Molson, Walter (*s*).

* *Stanstead Wesleyan College.*
(*s*) *With supplemental in one subject (arranged alphabetically).*

FOURTH YEAR (GRADUATING CLASS).

HONOURS.

In Geology, Mineralogy and Palæontology.

NOLAN, ANNIE W.—First Rank Honours and Logan Gold Medal.
DIXON, JENNIE D.—First Rank Honours.

In Mental and Moral Philosophy.

BICKERDIKE, MAY C.—Second Rank Honours.

In English Language and Literature.

WARRINER, J. EVA.—Second Rank Honours.
MUNN, ENMA M.—Second Year Honours.
IRVING, ELIZABETH.—Second Rank Honours.
CLOGG, VIVIAN E.—Second Rank Honours.

In History.

MUNN, W. CLEMENT.—First Rank Honours.
ADAMS, CHAUNCEY A.—Second Rank Honours.

First Rank General Standing.

CROWELL, SAMUEL G.—Special Certificate.
HARRIS, SPENCER DALE.—Special Certificate.
PLANT, VERNER L.—Special Certificate.
JACK, MILTON.—Special Certificate.

THIRD YEAR.

HONOURS.

LUNDIE E. HELEN.—First Rank Honours and Prize in Mathematics.
BOVEY, F. H. WILFRID.—First Rank Honours and Prize in Classics.
EAST, EDITH M.—First Rank Honours and Prize in Mental and Moral Philosophy.
LOMER, GERHARD R.—First Rank Honours and Prize in Mental and Moral Philosophy; Prize in English.
WALES, GRACE J.—First Rank Honours and Prize in English.
BELYEA, MARION E.—First Rank Honours in English.
JOHNSON, WALTER S.—First Rank Honours in English.
PARKIN, MAUD.—First Rank Honours and Prize in History; Annie McIntosh Prize.
COUTURE, GUI C.—First Rank Honours and Prize in History.
SEAMAN, JOHN C.—Second Rank Honours in Classics.
COLE, KATHERINE E.—Second Rank Honours in Mental and Moral Philosophy.
FEE, JAMES E.—Second Rank Honours in Mental and Moral Philosophy.
LOCKHART, ARTHUR R. B.—Second Rank Honours in Mental and Moral Philosophy.
WISDOM, KATHERINE F.—Second Rank Honours in Modern Languages; Prize in German.
HEALY, WALTER J.—Second Rank Honours in History.
TROOP, G. WILLIAM H.—Third Rank Honours in History.
DUTAUD, GUSTAVE.—Prize in French.
MACKAY, ERIC B.—Prize in Hebrew.

PASSED THE THIRD YEAR EXAMINATIONS.

(1) FOR THE COURSE LEADING TO B.A.

(Arranged in alphabetical order).

Angus, Ascah, Belyea, Bovey, Cameron, Cole, Couture, Davidson, Dutaud, East, Fee, Griffin (Gert.), Harris, Healey, Holman, Johnson, Lockhart, Lomer, Lundie, Lunny, Mackay, MacMorran, Parkin, Parkins, Seaman, Simister, Troop, Wales, Wisdom.

(2) FOR COURSE LEADING TO B.SC.

Gass, Helen.

SECOND YEAR.

HONOURS.

SHELDON, ERNEST W. (Barrie Coll. Inst.)—First Rank Honours and Prize in Mathematics; First Rank Honours and Prize in Logic and Psychology; First Rank General Standing.

MCCALLY, M. KATHLEEN (St. Thomas Coll. Inst.)—First Rank Honours and Prize in Mathematics.

MCGOUGAN, EDWARD (Glencoe H. S.)—First Rank Honours in Logic and Psychology.

ROSE, HERBERT J. (Ottawa Coll. Inst.)—Second Rank Honours in Logic and Psychology; First Rank General Standing; Prize in Latin; Prize in English.

SIMPSON, EDITH P. (McGill Normal School.)—Second Rank Honours in Mathematics; Second Rank Honours in Logic and Psychology; Prize in French.

LATHE, FRANK E. (Huntingdon Acad.)—Second Rank Honours in Mathematics; Prize in Chemistry.

MACMILLEN, HENRY H. (Ottawa Coll. Inst.)—Second Rank Honours in Mathematics.

MCKENZIE, ANGUS D. M. (Prince of Wales Coll., P.E.I.)—Second Rank Honours in Logic and Psychology.

ARCHIBALD, JOHN G. (M. H. S.)—First Rank General Standing; Prize in Greek; Prize in Latin; Prize in German.

FREEZE, HELEN (Girls' High School, St. John, N.B.)—Third Rank Honours in Logic and Psychology.

MACKENZIE, CATHERINE I. (M. H. S.)—Third Rank Honours in Logic and Psychology.

LOMER, THEODORE A. (M. H. S.)—Prize in Botany.

HINDLEY, J. GEORGE.—Prize in Hebrew.

RUBINOWITZ, ISRAEL (Vancouver Coll.)—Prize in Hebrew.

PASSED THE SESSIONAL EXAMINATIONS.

(1).—FOR COURSE LEADING TO B.A.

Class I.—Rose, Archibald, Sheldon; Lomer and Simpson, equal.

Class II.—Hart, Mackenzie (C. I.); Huntley and Mackenzie (A. D. M.), equal; Lathe and Shanks, equal; Dickson; Brown and Griffin and Gurd and McGougan, equal; McCallum and Rubinowitz and Wickware, equal; Campbell and McDonald and Mingie and Papineau, equal;

Class III.—Freeze and McCally, equal; Henry and MacLeod and Marshall, equal; Draper and Gardner, equal; Chandler, Wilson; Robertson and Stewart, equal; Craig, MacMillan, Bell, Bouchard (*s*), Findlay* (*s*), Logan (*s*), McDiarmid (*s*), MacFarlane (*s*), Molson (*s*).

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* *Stanstead Wesleyan College.*

(*s*). *With Supplemental Examination in one subject (arranged alphabetically),*

FIRST YEAR.

HONOURS.

KING, LOUIS V. (Montreal High School.)—First Rank Honours and Prize in Mathematics; First Rank General Standing; Prize in French.

MACMILLAN, GEORGE E. (Prince of Wales College, P.E.I.)—First Rank Honours and Prize in Mathematics; First Rank General Standing; Coster Memorial Prize.

CURTIS, WALTER E. (Prince of Wales College, P.E.I.)—First Rank Honours and Prize in Mathematics; First Rank General Standing.

MICHAELS, ROSEBUD F. (Montreal High School.)—First Rank General Standing; Prize in German.

IDLER, S. MAY (Montreal High School.)—Second Rank Honours in Mathematics; First Rank General Standing; Prize in Latin.

SMITH, ELLA L. (St. John High School.)—First Rank General Standing; Prize in Greek.

SHARP, F. EVELYN (Southfield, Jamaica.)—First Rank General Standing; Prize in English.

WALES, OSGOOD H. (Granby Academy.)—Second Rank Honours in Mathematics.

RABINOVITCH, MAX.—Prize in German.

PASSED THE SESSIONAL EXAMINATIONS.

FOR COURSE LEADING TO B.A.

King, Macmillan, Michaels; Idler and Smith (E. L.), equal; Curtis, Wales, McCuaig, Price, Fraser (G. A.)); Greenshields and Cartell, equal; Adams and Chodat and Tarbell, equal; Nicholson; McMurtry and Smith (M.), equal; McFee; Cousineau and Gillean, equal; Roy and Tupper, equal; Stewart (T. S.), Healy, Vineberg; Blanchard and Hyde, equal; Cotton; Robinson (F. G.) and Locke, equal; Halpenny, Bray.

Bowman (*s*), Cameron (*s*), Cushing (*s*), Dey (*s*), Edwards, (*s*), Fraser (A.) (*s*), Hepburn (*s*), Howitt (*s*), Lyman (*s*), MacNab (*s*), Moule (*s*), Munn (*s*), Ower (*s*), Perry (*s*), Rabinovitch (*s*), Ross (D.) (*s*), Stewart (W.) (*s*), Taber (*s*), Bajus (W. P.) (*s*), Donaldson (*s*), Laverock (*s*).

FOR COURSE LEADING TO B.SC.

Sharp, Hibbard.

STANDING IN THE SEVERAL SUBJECTS.

(Subjects alphabetically arranged).

FOURTH YEAR (GRADUATING CLASS).

ART AND ARCHAEOLOGY.

Class I.—Harris. *Class II.*—Greenleese.

ASTRONOMY AND OPTICS.

Class II.—Fraser.

(*s*). *With Supplemental Examination in one subject (arranged alphabetically),*

CHEMISTRY (ORGANIC).

Class I.—Pruyn. *Class II.*—McLachlan and McDonald, equal.

CONSTITUTIONAL LAW.

Class I.—Brodie.

ENGLISH LITERATURE.

Class I.—Plant. *Class II.*—Smith, Munn, Warriner, Irving, Harris, (A.F.), Clogg, Harris (S.D.). *Class III.*—Crothers, Ireland, Parker, Greenleese.

ENGLISH COMPOSITION.

Class I.—Crowell and Day and Smith, equal; Plant. *Class II.*—Murphy, Crothers and Ireland, equal; Carson; Harris and Jack; Blagrave and Brodie, equal. *Class III.*—Pruyn and Reid, equal; McDonald and Parker and Greenleese, equal; Cole, Fraser, Irving (G.), McLachlan.

GERMAN.

Class III.—Greenleese.

GEOLOGY.

Class I.—Jack. *Class II.*—Plant, Reid, Ireland, Parker, Walker, Smith, Greenleese, Carson.

HEBREW.

Class I.—Reid, Blagrave, Jack.

HISTORY.

Class II.—Carson and Crothers, equal. *Class III.*—Day.

LATIN.

Class I.—Crowell. *Class II.*—Munn (E.M.), Day.

MECHANICS.

Class I.—Fraser.

MORAL PHILOSOPHY.

Class I.—Plant, Bickerdike, Reid. *Class II.*—Bartlett, Carson; Howard and Irving, equal; Day. *Class III.*—Cleland and Whiteside, equal; Cole and Crothers and Sharp, equal; Mackenzie, Fraser, McEachern, Mitchell.

PHYSICS (SOUND, LIGHT AND HEAT).

Class I.—Blagrave.

PHYSICS (ELEC AND MAGNETISM).

Class I.—Harris. *Class III.*—Cole.

POLITICAL SCIENCE.

Class I.—McLachlan, Munn, Crowell, Brodie. *Class II.*—Irving. *Class III.*—Adams.

POLITICAL ECONOMY.

Class I.—Crowell, Pruyn. *Class II.*—McDonald, Murphy.

PUBLIC FINANCE.

Class I.—Smith, Blagrave. *Class II.*—Plant, Ireland, Parker.

ROMAN LAW.

Class I.—Brodie.

ZOOLOGY.

Class II.—Dixon, Nolan. *Class III.*—Walker.

THIRD YEAR.

ART AND ARCHAEOLOGY.

Class II.—Harris. *Class III.*—Simister, Cameron.

BOTANY.

Class II.—Gass, McDiarmid, Holman, McLeod.

CHEMISTRY.

Class III.—Gass.

ENGLISH COMPOSITION.

Class I.—Davidson, Harris, Blackader, Simister, McMorran. *Class II.*—Griffin, Parkins, Dutaud. *Class III.*—Carruthers, Holman, Gass, Lunny; Fripp and Mowatt, equal; Cameron, Ascah; Mackay and MacLeod, equal.

ENGLISH LITERATURE.

Class I.—Lomer (Prize), Parkins. *Class II.*—Johnson, Belyea, Davidson and Wales, equal. *Class III.*—Fee, Simister, McLeod, Carruthers, Dutaud.

FRENCH.

Class I.—Dutaud; Cole and Griffin, equal; Wisdom. *Class II.*—Lunny, Mackay. *Class III.*—Noyes.

GEOLOGY.

Class I.—East, Lundie. *Class II.*—Lunny, Cameron; Carruthers and Ascah, equal; Woodside, Mowatt. *Class III.*—Mitchell, Dunlop.

GERMAN.

Class II.—Griffin and Lunny and Wisdom, equal.

GREEK.

Class I.—Bovey. *Class II.*—Seaman.

HEBREW.

Class I.—Mackay (prize) and Mowatt, equal.

HISTORY.

Class I.—Couture, Parkin; Davidson and Dutaud, equal; Belyea and Parkins, equal; Johnson, Cox, Healey. *Class II.*—Harris, Troop. *Class III.*—Holman, Mackay, Lockhart.

ITALIAN.

Class I.—Griffin, Wisdom.

LATIN.

Class I.—Bovey. *Class II.*—Seaman.

MENTAL PHILOSOPHY.

Class I.—East, McMorran, Lomer. *Class II.*—Cameron, Cole, Fee. *Class III.*—Lockhart, Simister; Fisher and Hoffman, equal; Baker, Morrow.

MORAL PHILOSOPHY.

Class I.—Davidson, McCutcheon. *Class II.*—Carruthers, Ascah, *Class III.*—Seaman, Mackenzie.

MECHANICS.

Class I.—Lundie.

PHYSICS (EXPERIMENTAL).

Class I.—Bovey, Lundie.

POLITICAL ECONOMY.

Class I.—McMorran, Wales. *Class II.*—Cameron, Fripp. *Class III.*—Mc Eachern, Mowatt, Woodside.

POLITICAL SCIENCE.

Class I.—Couture. *Class II.*—Harris, Parkins, Parkin, Dutaud. *Class III.*—Simister, Healey, Troop, Dunlop, Ascah.

ZOOLOGY.

Class II.—McMorran. *Class III.*—Holman, Gass.

SECOND YEAR.

BIOLOGY (ELEMENTARY).

Class I.—Lomer (prize), Gurd. *Class II.*—Griffin; Macfarlane and Papineau, equal ; Shanks and Gardner, equal ; Campbell, Hindley. *Class III.*—Chandler, Gray, Wright.

BOTANY.

Class I.—McCallum.

CHEMISTRY.

Class I.—Lathe; Lomer and Marcuse and McDiarmid and Rose, equal ; Freeze and Mingie, equal. *Class II.*—Gurd ; Mackenzie and Shanks, equal ; Brown and Dickson and McGougan and Walker, equal ; Chandler and McCallum, equal ; Campbell and Wickware and Marshall, equal ; MacLeod. *Class III.*—Draper and McMillen, equal; Dickenson and Emmerson and McCoy, equal ; Harvie and MacFarlane and Stewart, equal.

ENGLISH.

Class I.—Rose (prize), Archibald, Hart, Campbell; Lomer and Dickson, equal; McCallum, Mackenzie (C. I.), Bouchard. *Class II.*—Shanks and Sheldon, equal; Papineau, McGougan; Draper and MacLeod, equal; Simpson, Griffin, Wilson; Hindley and McCally and McKenzie (A. D. M.), equal; Gardner and Gurd, equal; Brown and Henry and Mingie, equal; McDonald and Rubinowitz, equal; Freeze; Gray and McDiarmid, equal; Chandler and Marshall and McFarlane, equal; Stewart (L. J.). *Class III.*—Findlay†; Craig, and Thomson, equal; Logan, Robertson; Arnold and Bell and McCoy and Walker, equal; Dickenson, Kimber; Lathe and MacMillan and Wickware, equal; Cranet, Wright, Stewart (J. U.).

FRENCH.

Class I.—Simpson, Lomer, Bouchard, Rose *Class II.*—Mackenzie, Brown; Marshall and Papineau, equal; Hart, McCallum. *Class III.*—Robertson; McDonald and McCally and McFarlane, equal; Draper; Gardner and Griffin, equal; Freeze; Stewart and Wilson, equal; Kimber, Henry, Logan, Craig, Molson, Findlay.†

GERMAN.

Class I.—Archibald. *Class II.*—McCally, Dickson, Gardner, Robertson, Henry. *Class III.*—Bouchard, Bell, McDiarmid, Craig, Kimber.

GREEK.

Class I.—Archibald* (prize), Rose*, Mackenzie (C. J.), Sheldon, Hart. *Class II.*—Simpson, McKenzie (A. D. M.). *Class III.*—MacLeod, McGougan, Wilson, Mingie.

HEBREW.

Class I.—Hindley and Rubinowitz, equal (prizes); MacKenzie, (A. D.), McCutcheon. *Class II.*—McGougan; Stewart and Mingie, equal *Class III.*—McEachern, Duguid.

LATIN

Class I.—Archibald* (prize) and Rose* (prize), equal; Simpson, Sheldon, McKenzie, Hart. *Class II.*—Griffin (Gert.) and Hindley, equal; Wickware; Brown and MacLeod, equal; Lomer, Shanks; Lathe and Molson, equal. *Class III.*—Dickson, Bouchard and Draper and Henry, equal; Craig and McCallum; Griffin (Grace), Gardner; Campbell and McDonald and McMillen, equal; Wilson McCally; Gurd and Stewart (Lill.), equal; Marshall and Papineau, equal; Freeze, Chandler and Rubinowitz, equal; Bell, Bridgette, Harvie, Logan, Robertson.

LOGIC.

Class I.—Sheldon (prize), Archibald, Rose, Simpson; Hindley and Mackenzie (A. D.), equal; Griffin; Lathe and McGougan, equal; Shanks. *Class II.*—McDonald; Brown and Wilson, equal; McCally; Gurd and Hart and Rubinowitz, equal; Mingie; McCallum and Mackenzie (C. I.), equal; Freeze and Gray and Walker, equal; Macfarlane and Papineau, equal; Chandler and Wickware, equal; Campbell; Findlay† and McLellan, equal; Dickson, Marshall, Stewart. *Class III.*—Dickenson, Draper, Bridgette†, Cranet†, Meech, Logan; Henry and Molson, equal; Macleod, Macmillan, Ormiston, Baker, Bell.

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† *Stanstead Wesleyan College.*
* *Distinction in Examination.*

MATHEMATICS

(1). SPHERICAL TRIGONOMETRY AND ALGEBRA.

Class I.—Sheldon, Wickware, McDonald. *Class II.*—Rubinowitz. *Class III.*—Craig, Henry, Hart; Robertson and Stewart, equal; Findlay†, Mackenzie, Harvie, Molson, Bell; Wilson and Bridgette†, equal.

MATHEMATICS.

(2). SOLID GEOMETRY. CONIC SECTIONS. DYNAMICS.

Class I.—Findlay†; Sheldon and Wickware, equal; Rubinowitz, Bridgette†, Emmerson. *Class II.*—McDonald, Henry, Dickenson, Bell; Harvie and Hart, equal; Molson. *Class III.*—Mackenzie, Craig, Wilson; Gaunt and Robertson, equal; Stewart.

FIRST YEAR.

ENGLISH.

Class I.—Walker, Sharpe (prize), Idler, Taber, McMillan, King, Michaels, Edwards; Hill and Wales, equal. *Class II.*—Greenshields; Moule and Howitt, equal; Adams and Bowman and Smith (E. L.), equal; Laverock;§ Fraser (A). and McMurtry, equal; Pearson and Smith (M.), equal; Chodat. *Class III.*—Cameron, Curtis, Call,† Cattell,§ Healy, McCuaig, McFee, Carter, Fraser (G.A.), Lyman and Owen and Hepburn, equal; Gillean and Robinson (F.G.) and Thomson and Vineberg, equal; Price,§ Christie, Manley, Munn; Blanchard and Cousineau and Dunham, equal; Lewis (Edith) and Hibbard and Stewart (W.), equal; Tarbell;§ Featherstonhaugh and Ross (D.), equal; Roy, Perry, Bajus (K.),§ Braidwood; Locke and Nicholson, equal; Tannenbaum; Donaldson§ and Bajus (W.),§ equal; Bray,§ Dawson, Dey, Hyde, Stewart (T.), Robinson (W.), Brodie, Levy, Tupper, Shearer, Hepburn,§ Gibsone.

FRENCH.

Class I.—Walker, Chodat, King, Roy, Michaels, Sharpe. *Class II.*—Greenshields, Idler, Levy, Cushing, Gibsone, Rabinovitch, Adams, McMurtry, Wales. *Class III.*—Bowman; Lyman, Cousineau and Hyde, equal; Pearson; Call,† Dey, Gilmour (M.), Hepburn and Fraser, equal; Munn, McFee, Blanchard, Hibbard; Cameron, Gillean, Healy and Locke, equal; Christie, Cotton, Kaye and Tannenbaum, equal; Stewart (T.), Jenkins, Robinson (W.); Flanders,† Fraser (A. B.), and Lewis, equal; Carter; Robinson (F. G.) and Ross, equal; Smith and Prendergast, equal; Bajus (K. L.),§ Featherstonhaugh, Ross (C.E.), and Price,§ equal; Bray§ and Tupper, equal; Stewart (W.), Milne.§

GERMAN.

Class I.—Michaels, Idler, Walker, Laverock.§ *Class II.*—Vineberg, Cattell,§ Tarbell,§ Henderson,§ Smith (M.) *Class III.*—Levy.

GERMAN (BEGINNERS').

Class I.—Rabinovitch. *Class II.*—Sharpe, Gilmour. *Class III.* Prendergast, Hibbard, Healy.

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† *Stanstead Wesleyan College.*
§ *Vancouver College.*

GREEK.

Class I.—Smith (E. L.) (prize), MacMillan (G. E.), McCuaig, Hepburn; Wales and Fraser, equal. *Class II.*—Nicholson, Munn (L. A.), Curtis, Taber, Edwards. *Class III.*—McNab, Halpenny, Shearer, Dawson; Jenkins and Locke and Cross, equal.

LATIN.

Class I.—Idler* (prize) and Walker,* equal; MacMillan and Michaels, equal; Cushing and King, equal; McCuaig, Smith (Ella), Price,§ Cattell,§ Curtis and Tarbell,§ equal; Edwards and Rabinovitch, equal; Bray.§ *Class II.*—Munn, Laverock,§ Gibsone, Hepburn (F. E.), Wales, Fraser (Geo.), Smith (May); Ower and Taber, equal; Nicholson, Bajus (W.),§ Greenshields, Adams, MacNab. *Class III.*—Gillean; Henderson§ and Tupper and Vineberg, equal; Chodat and Manley, equal; Roy; McMurtry and Perry, equal; Blanchard and Lyman, equal; Hyde, Donaldson;§ Howitt and Cousineau, equal; Cameron and Cotton and McFee and Robinson (F. G.), equal; Hill, Bajus (K.)§ and Healy, equal; Call and Halpenny and Jenkins, equal; Milne§ and Moule, equal; Stewart (W.) and Stewart (T. S.), equal.

GEOMETRY AND ARITHMETIC.

Class I.—Perry, King, Curtis, McCuaig, Donaldson;§ Stewart (T.) and Wales and Cattell,§ equal; Hibbard and Thomson and Price,§ equal; Fraser (G. A.) and Smith (E.), equal; Cushing and Nicholson and Ower, equal. *Class II.*—Moule and Bajus (W. P.),§ equal; MacMillan; Cousineau and Stewart (W.), equal; Hill, Molson; Tupper and Idler, equal; Adams and Greenshields and Shearer and Milne§ and Tarbell,§ equal; Nacnab and Rabinovitch, equal; Howitt, Hyde, Michaels; Blanchard and Sharpe, equal; Tannenbaum, Ross (D.); Dawson and Call,† equal. *Class III.*—Munn, Gibsone and McMurtry and Robinson (W. W.), equal; Taber and Vineberg, equal; Cotton and Roy and Healy, equal; Manley; Lyman and Braidwood, equal; Chodat and Bajus§ (K.), equal; Locke and Pearson and Smith (M.), equal; Cameron and Bowman, equal; Laverock,§ Ross (C. E.); Fraser (A.) and Bray,§ equal; Kaye, Hepburn (F.), Dey; McFee and Gillean and Henderson,§ equal; Christie, Robinson (F. G.), Griffin.

TRIGONOMETRY AND ALGEBRA

Class I.—King; MacMillan and Michaels, equal; Price,§ Thompson. *Class II.*—Bowman; Cushing and Stewart (T.), equal; Bajus§ (W. P.); Fraser (G. A.) and Wales, equal; Smith (E.), Adams, Rabinovitch; Healey and Sharpe, equal; Ower; Hibbard and Perry, equal; Chodat, Gillean, Curtis. *Class III.*—McFee and Smith (M), equal; Cousineau and Moule, equal; Locke and Ross (D.), equal; McCuaig; Robinson (W. W.) and Donaldson,§ equal; Tupper and Munn, equal; Blanchard and Cattell,§ equal; Hyde; Greenshields and Howitt and Lyman and Macnab and Manley and Vineberg, equal; Cotton, Jenkins; McMurtry and Roy and Idler, equal; Cameron and Tannenbaum and Milne§ and Tarbell,§ equal; Molson and Griffin, equal; Bray§ and Henderson,§ equal; Cross and Nicholson, equal; Taber and Hill, equal; Braidwood, Dunham; Dey and Robinson (F. G.), equal; Fraser (A.), Hepburn (F.).

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* *Distinction in Examination.*
§ *Vancouver College.*
† *Stanstead Wesleyan College.*

PHYSICS.

Class I.—King, McFee, Curtis, Idler, Hibbard, Bajus (W.),§ MacMillan and Price,§ equal; Bray§ and Sharpe, equal; Flanders† and Greenshields, equal. *Class II.*—Chodat, Ower; McMurtry and Ross and Thomson, equal; Perry and Stewart(T.S.) and Tarbell,§ equal; Cross and Michaels and Moule, equal; Cattell§ and Cousineau, equal; Tupper. *Class III.*—Nicholson, Smith (E.L.), Stewart (W.); Hyde and Wales, equal; Adams and Fraser (G. A.), equal; Fraser (A. B.); Bowman and Cotton, equal; Molson and Robinson (F. G.), equal; Donaldson§ and Jenkins and McCuaig and Smith (M.), equal; Dey, Rabinovitch; Dawson and Dunham and Howitt and Roy, equal; Healy; Cushing and Gillean, equal; Baker and Hitchcock† and Laverock§ and Manley, equal; Edwards, Blanchard, Vineberg.

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§ *Vancouver College.*
† *Stanstead Wesleyan College.*

Faculty of Applied Science.

FOURTH YEAR (GRADUATING CLASS).

HONOURS.

(In alphabetical order.)

CAMPBELL, CHARLES MCKINNON.—Prize for Summer Thesis.
CORLESS, CHARLES VANDYKE.—British Association Exhibition; British Association Medal and Prize; First Carlyle Prize; Honours in Geology, Mineralogy, Mining Machinery, Electro-Metallurgy and in Metallurgy of Iron and Steel.
DEPENCIER, HENRY PERCY.—Prize for Summer Thesis; Allis-Chalmers Scholarship; Second Carlyle Prize.
FRANKLIN, EMERSON LORAN (B.A.)—Honours in Electrical Engineering Laboratory Work.
HEAMAN, JOHN ANDREW.—British Association Medal and Prize; Prize for Summer Thesis; Honours in Designing and Municipal Engineering.
HICKS, THOMAS NORMAN.—Honours in Electrical Designing.
SCOTT, HARRY EVART (B.A.)—British Association Medal and Prize; Prize for Summer Thesis; Honours in A.C. Machinery, Electrical Engineering Laboratory Work and Electrical Designing.
SHAW, HERBERT HAROLD.—Prize for Summer Thesis.
SMITH, GERALD MEREDITH.—Prize for Summer Thesis; Honours in Dynamics of Machinery and Thermodynamic Laboratory Work.
SMITH, JAMES MACDONALD.—Honours in Electrical Designing and Electrical Laboratory Work.
STERNS, FRANK ERNEST.—British Association Prize; British Association Medal and Prize; Honours in Designing, Dynamics of Machinery, Hydraulics and Hydraulic Machinery, Machine Design, Metallurgy, Thermodynamics and Thermodynamic Laboratory Work.

PASSED FOR THE DEGREE OF BACHELOR OF SCIENCE.

(In order of merit.)

CIVIL ENGINEERING.

Heaman, John Andrew, London, Ont.
Shaw, Herbert Harold, Brackley Point, P.E.I.
Bigger, Howell Ottawa, Ont.
Borden, Henry Percy, Kentville, N.S.
Cameron, Kenneth McKenzie, London, Ont.

ELECTRICAL ENGINEERING.

Scott, Harry Evart, Napanee, Ont.
Dunfield, John Collier Withers, St. John's, Newfoundland.
Franklin, Emerson Loran (B.A.), Wolfville, N.S.
Maxwell, Marshall Andrew, St. Stephen, N.B.
Hicks, Thomas Norman, Perth, Ont.
Smith, James Macdonald, Petitcodiac, N.B.
Jackson, Philip T., Toronto, Ont.
Murphy, William Edward, Shelburne, N.S.
Boyd, Hugh Harkness, Montreal, Que.
Higman, Ormond, Ottawa, Ont.
Forman, Andrew Shearer, Montreal.

MECHANICAL ENGINEERING.

Sterns, Frank Ernest, Morrell, P.E.I.
Smith, Gerald Meredith, St. Johns, Que.
Fry, David Merner, Bright, Ont.
Newton, Samuel Robert, Drummonville, Que.
Addie, Thomas Heriot, Sherbrooke, Que.
Baird, Alexander, Sherbrooke, Que.

MINING ENGINEERING.

Corless, Charles Vandyke, New Durham, Ont.
DePencier, Henry Percy, Vancouver, B.C.
Campbell, Charles McKinnon, Winnipeg, Man.
McBride, Wilbert George, Inglewood, Ont.
Coulson, John Leys, Toronto, Ont.
Burchell, George Bartlett, New Campbellton, N.S.

PRACTICAL CHEMISTRY.

Labatt, John Sackville, London, Ont.

THIRD YEAR.

PRIZES.

(In alphabetical order.)

Boright, Serman H.—First McCarthy Prize for Field Work.
Conklin, Roscoe Y.—Can. Gen. Elect. Scholarship.
Cole, G. Percy.—Can. Gen. Elect. Scholarship.
Egleson, James E. A.—Prizes for Organic Chemistry and Mineralogy.
Foreman, Alvah E.—Can. Gen. Elect. Scholarship; First Mathematical Prize; Prize for D. C. Dynamo Machinery, Electrical Measurements, Thermodynamics, Dynamics of Machinery, Graphical Statics and Theory of Structures.
Hall, Oliver.—Prizes for Testing Laboratory Work, Mineralogy and Museum Work in Geology.
Keith, Fraser S.—Can. Gen. Elect. Scholarship.
Lodge, William Lloyd (M.A.).—Prizes for Metallurgy and Assaying.
Lucas, Allan S. B., (B.A.).—Second McCarthy Prize for Field Work.
Musgrave, Robert.—Second McCarthy Prize for Field Work.
Roberts, Arthur R.—Prizes for Mechanical Drawing, Thermodynamics, Testing Laboratory Work, Mechanics, Dynamics of Machines, Calculus, and Machine Design.

THIRD YEAR.

PASSED THE SESSIONAL EXAMINATIONS.

(In order of merit.)

CIVIL ENGINEERING.

Jones, Harold W., Ottawa, Ont.
*Beck, Alfred E., Penetanguishene, Ont.
*Cohen, Harris, Montreal.
*Landry, Pierre A., Dorchester, N.B.

Haffner, Henry J. A., Winnipeg, *ægrotat.*

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* *To pass Supplemental Examination.*

ELECTRICAL ENGINEERING.

Foreman, Alvah E., Vancouver, B.C.
Conklin, Roscoe Y., (B.A.), Winnipeg, Man.
Keith, Fraser S., Smith's Falls, Ont.
*Cole, G. Percy, Montreal, Que.
*McDonald, James Finley, Westville, N.S.
*McCaskill, Kenneth, Vankleek Hill, Ont.
*Stokes, Charles W., Woodstock, N.B.
*Thorpe, William H., Montreal, Que.
*Rodger, Herbert F., St. John's, Nfld.
*Baker, William E., Montreal, Que.
*Peaslee, Alexander S. L., Defiance, Ohio, U.S.A.
*Trimingham, Charles L., Barbadoes, West Indies.
*Blatch, Harry E., St. John's, Nfld.
*James, Bertram, Heart's Content, Nfld.

MECHANICAL ENGINEERING.

Roberts, Arthur R., Montreal, Que.
Brown, Frederick B., Montreal, Que.
McKay, Frederick A., Montreal, Que.
McKergow, Charles M., Westmount, Que.

MINING ENGINEERING.

Hall, Oliver, Washington, Ont.
Lucas, A. Stanley B., (B.A.), Hamilton, Ont.
Boright, Sherman H., Sutton, Que.
*Gale, George G., Quebec, Que.
*Rowlands, Charles, Albany, N.Y., U.S.A.
Stovel, Joseph H., Toronto, Ont.
*Pemberton, William P. D., Gonzales, Victoria, B.C.
*Tilt, Edwin B., Goderich, Ont.
Kendall, George B., Vancouver, B.C.
*Musgrave, Robert, Duncans, Vancouver Island, B.C.
*Langley, Albert G., Victoria, B.C.
*Richards, Charles C., Charlottetown, P.E.I.
*Ross, James G., Embro, Ont.

PRACTICAL CHEMISTRY.

Egleson, James E. A., Ottawa, Ont.
*Musgrave, William N., Duncans, Vancouver Island, B.C.
*Savage, George M., Montreal, Que.
Lodge, W. Lloyd (M.A.), Charlottetown, P.E.I.
*Crawford, Stuart, Montreal, Que.

SECOND YEAR.

PRIZES.

(In alphabetical order.)

Blumenthal, Samuel—Prizes for Mathematics, Physics, Descriptive Geometry and Theoretical Chemistry.
Chaplin, Charles J.—Scott Prize; Prize for Descriptive Geometry.
Cole, George H.—Scott Prize; Prize for Physical Laboratory Work.
Lawrence, William D.—Prizes for Mathematics and Surveying.
LeMaistre, Frederick J.—Prize for Practical Chemistry.
McCloskey, Frederick W.—Prize for Physical Laboratory Work.
McDougall, Clarence H.—Prize for Surveying Fieldwork.
McPhee, James M.—Scott Prize; Prize for Descriptive Mechanism.

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* *To pass Supplemental Examination.*

PASSED THE SESSIONAL EXAMINATIONS.

(In order of merit.)

CIVIL ENGINEERING.

Blumenthal, Samuel, Montreal, Que.
Lawrence, William D., Maitland, Hants Co., N.S.
Harvey, John B., Lyndhurst, Ont.
Kent, George H., Truro, N.S.
*Hogan, John, Westmount, Que.
†Lambart, Howard F., Ottawa, Ont.
*Dawe, Robert G., Bay Roberts, Newfoundland.

ELECTRICAL ENGINEERING.

McCloskey, Frederick W., Boiestown, N.B.
Cole, George H., Ottawa, Ont.
McDougall, George K., Montreal, Que.
Cardew, John H., Young's Point, South Beach, Ont.
Marrotte, Louis H., Westmount, Que.
*Wenger, John A., Ayton, Ont.
*Roffey, Miles H., Braintree, Essex, England.
*Devlin, Cecil G., Mohawk, Ont.
*Fullington, Moses A., Newport, Vt., U.S.A.
*Mundy, Oswald A., Hamilton, Ont.
*Piché, Ernest A., Montreal, Que.

MECHANICAL ENGINEERING.

Chaplin, Charles J., Westmount, Que.
Drysdale, William F., Montreal, Que.
Kemp, Robert A., Seaforth, Ont.
Greey, John W. G., Toronto, Ont.

MINING ENGINEERING.

McPhee, James M., Loch Katrine, Ant. Co., N.S.
Dutcher, Howard K., Charlottetown, P.E.I.
Forbes, Harry L., Waverley, Halifax Co., N.S.
Parlee, Norman W., Rossland, B.C.
*Harris, Spencer L. Dale, Ottawa, Ont.
Carlyle, Ernest J., Woodstock, Ont.
McDougall, Clarence H., South Maitland, N.S.
Davis, Patrick, Windsor, Ont.
Atkinson, M. Brodie, Montreal, Que.
Taylor, Reginald T., Gananoque, Ont.
Sullivan, Michael H., Ottawa, Ont.
Chambers, Robert A., Truro, N.S.
*Gnaedinger, Ernest G., Montreal, Que.
*Grice, J. Hugh, Bootle, Cumberland, England.
Ells, Sidney C. (B.A.), Ottawa, Ont.
*Wisdom, Stuart A., Dartmouth, N.S.
*McMurtry, Gordon O., Montreal, Que.
*Cole, G. Edwards, Westmount, Que.
*Webster, George B., Montreal, Que.
*Campbell, Colin St. G., Aldershot, Ont.

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* *To pass Supplemental Examination.*
† *Matriculation conditioned.*

PRACTICAL CHEMISTRY.

Johnson, Frederick M. G., Montreal, Que.
LeMaistre, Frederick J., Westmount, Que.

Special Course.—McNaughton, William G. (B.A.), Huntingdon, Que.

FIRST YEAR.

PRIZES.

(In alphabetical order.)

Blanchet., Guy H.—Prize for Physics.
Boyle, Robert W.—Prizes for Mathematics and English.
Burpee, Lockwood.—First Fleet Workshop Prize.
Fysche, Thomas M.—Prize for Mathematics.
Jewett, F. Coburn.—Prize for English.
Johnstone, George A.—Prize for Descriptive Geometry.
Jost, Edward B.—Second Fleet Workshop Prize; Prizes for Mathematics and Lettering.
MacDermot, Sidney G. F.—Prize for Mathematics.
Pinch, Harry H.—Prize for Freehand Drawing.
Scouler, Gavin T.—Prize for Physics.

PASSED THE SESSIONAL EXAMINATIONS.

(In order of merit. Students of equal standing are bracketed together.)

Boyle, Robert W., Carbonear, Nfld.
Jewett, F. Coburn, Sheffield, N.B.
Blanchet. Guy H., Ottawa, Ont.
Fysche, Thomas M., Montreal, Que.
†Johnstone, George A., Rednersville, Ont.
McLeish, Ian, Montreal, Que.
†Archibald, Hiram H., Harbour Grace, Nfld.
Jost, Edward B., Guysboro, N.S.
MacDermot, Sidney G. F., Ropley, Gordon Town, Jamaica, W.I.
Cropper, William C. McD., Kingston, St Vincent, W.I.
Pattison, Albert M., Clarenceville, Que.
Willard, Charlie, Morrisburg, Ont.
Glassco, Gordon B., Hamilton, Ont.
Scouler, Gavin T., New Westminster, B.C.
Churchill, Cecil A., Hantsport, N.S.
[Livingston, Douglas C., Corfield, B.C.
[Macnab, John J., Elsinore, Bruce Co., Ont.
*Campbell, John A., Cheltenham, Ont.
Wheaton, Hazen A., Elgin, Albert Co., N.B.
Kydd, George, Montreal, Que.
Bowness, Ernest W., Kensington, P.E.I.
Redpath, William, Montreal, Que.
Burpee, Lockwood, Gibson, N.B.
*Drinkwater, Kenneth E., Montreal, Que.
[†Cunha, Staton H. S., Kingston, Jamaica, W.I.
[McLean, Donald (B.A.), Campbellton, N.B.
[†Blackadar, Thomas B., Hebron, Yarmouth, N.S.
[McIntosh, Robert, Newcastle, Ont.

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* *To pass Supplemental Examination.*
† *Matriculation conditioned.*

Cram, Alexander S., Smith's Falls, Ont.
Ross, Walter G., Port Perry, Ont.
Mooney, Chester A., Ausable Chasm, N.Y., U.S.A.
Turnbull, Harvard, Montreal, Que.
Wright, Clifton H., Barbadoes, W.I.
Cockshutt, Harvey W., Brantford, Ont.
Miner, R. Herbert, Cowansville, Que.
Robertson, Arthur F., Montreal, Que.
*Belanger, Victor E. A., L'Orignal, Ont.
*Frame, Stanley H., Gay's River, Colchester Co., N.S.
*Sharpe, George P., Agassiz, B.C.
Pinch, Harry H., Owen Sound, Ont.
Young, Horace G., Oznabruck, Ont.
*Ritchie, A. Bruce, Halifax, N.S.
*†Eadie, George H. H., Montreal, Que.
*†Gibbs, Harold E., Port Arthur, Ont.
†Sutherland, Daniel H., River John, N.S.
*†Small, Edward A., Montreal, Que.

ADMITTED TO THE DEGREE OF MASTER OF SCIENCE.

(In Course.)

Burson, Herbert Arthur, B.Sc., St. Catharines, Ont.
Clement, Sheldon Byrne, B.Sc., Kingsville, Ont.
Edwards, William Muir, B.Sc., Montreal, Que.

ADMITTED TO THE DEGREE OF DOCTOR OF SCIENCE.

(In Course.)

Adams, Frank Dawson, B.A.,Sc., M.A..Sc., Ph.D., Montreal.
Dawson, William Bell. B.A., M.A., MaE., Ottawa.

GRADUATE RESEARCH WORK.—The Tighe prize has been awarded to S. B. Clement for his research on the "critical velocity of water."

STANDING IN THE SEVERAL SUBJECTS.

(Subjects alphabetically arranged).

ALTERNATING CURRENT AND ALTERNATING CURRENT MACHINERY.

FOURTH YEAR.—*Class I.*—Scott. *Class II.*—Franklin. *Class III.*—MacKay (E.), Hicks, Dunfield; Jackson and Maxwell and Smith, equal; Higman and Murphy, equal; Forman.

ARCHITECTURAL DRAWING (OPTIONAL).

SECOND YEAR.—*Class I.*—None. *Class II.*—Harvey, Kent. *Class III.*—Blumenthal and Lawrence, equal; Dawe and Hamilton, equal.

ASSAYING.

THIRD YEAR.—*Class I.*—Lodge, Lucas (A. S. B.). *Class II.*—Carter; Pemberton and Rowley, equal: Boright, Egleson; Maclaren and Musgrave (W. N.), equal; Hall and Rowlands and Savage, equal; Gale and Langley and Musgrave (R.), and Ross and Stovel, equal; Tilt, Brainerd. *Class III.*—Kendall and Richards, equal; Crawford, Cameron.

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* *To pass Supplemental Examination.*
† *Matriculation conditioned.*

ASTRONOMY (PRACTICAL).

THIRD YEAR.—*Class I.*—Hall. *Class II.*—Jones, Lucas, Gale, Pemberton, Rowley, Stovel, Musgrave. *Class III.*—Carter and Richards, equal; Tilt, Maclaren, Cohen, Boright, Kendall; Langley and Landry, equal; Rowlands, Ross.

CHEMISTRY (ORGANIC).

FOURTH YEAR.—*Class II.*—Labatt.

CHEMISTRY—ORGANIC—(PRACTICAL).

FOURTH YEAR.—*Class II.*—Labatt.
THIRD YEAR.—*Class I.*—Crawford and Egleson and Lodge and Musgrave and Savage, equal. *Class II.*—McNaughton.

CHEMISTRY—ORGANIC—(THEORETICAL).

THIRD YEAR.—*Class I.*—Egleson, Lodge. *Class II.*—Savage, Musgrave, Crawford. *Class III.*—McNaughton.

CHEMISTRY (PRACTICAL).

SECOND YEAR.—(*Civil, Electrical and Mechanical Engineering Courses.*)—*Class I.*—Chaplin and McDougall and Pippy, equal; Dawe and Hamilton (W.), equal. *Class II.*—Harvey; Fullington and Hogan and Mundy and Piché, equal; Cole (G.H.), Wenger, Roffey. *Class III.*—Kemp; Blumenthal and Drysdale and Lawrence, equal; Cardow and McCarthy and McCloskey, equal; Marrotte, Kent; Anderson and Devlin and Greey and Price and Wilkes and Wurtele, equal. (*Mining Engineering Course*)—*Class I.*—McIntyre; Atkinson and Davis and Forbes, equal; Crichton and McDougall and McPhee and Wisdom, equal. *Class II.*—Taylor and Wilson, equal; Campbell, Parlee. *Class III.*—Baker and Chambers and Grice and McMurtry and Sullivan, equal; Ells and Webster, equal. (*Practical Chemistry Course.*)—*Class I.*—LeMaistre. *Class II.*—Holland and Johnson, equal.

CHEMISTRY (THEORETICAL).

SECOND YEAR.—*Class I.*—Blumenthal, Forbes. *Class II.*—McCloskey and McPhee, equal; Johnson, Cole (G.H.), LeMaistre Parlee, Chaplin, Grice, Hogan, Atkinson, McDougall (G.K.); Davis and Harvey, equal. *Class III.*—Roffey; Kent and Lawrence and McDougall, equal; Kemp, Chambers, Greey; Devlin and Ells, equal; Marrotte and Sutherland and Wisdom, equal; Baker and Holland and Pippy and Webster, equal; Campbell and Sullivan, equal; McIntyre and Piche, equal; Taylor; Cardew and Drysdale and McMurtry, equal; Lambart; Fullington and Martin and Price, equal.

CHEMISTRY (INDUSTRIAL).

THIRD YEAR.—*Class I.*—Egleson, Musgrave (N.W.), Lodge. *Class II.*—Crawford, Savage, MacNaughton.

CHEMISTRY (PHYSICAL).

FOURTH YEAR.—*Class I.*—None. *Class II.*—Canning. *Class III.*—Labatt.

CHEMISTRY—PHYSICAL—(PRACTICAL).

FOURTH YEAR.—*Class I.*—Canning. *Class II.*—None. *Class III.*—Labatt.

D.C. DYNAMO MACHINERY.

THIRD YEAR.—*Class I.*—Foreman, McDonald, Cole. *Class II.*—McCaskill. *Class III.*—Keith, Conklin ; Peaslee and Rodger, equal; Trimingham, Thorpe.

DESCRIPTIVE GEOMETRY.

SECOND YEAR.—*Class I.*—Blumenthal and Chaplin, equal ; Dutcher and McCloskey, equal ; Lawrence and McPhee, equal ; Marrotte ; Drysdale and Harvey, equal ; McDougall, Cole (G. H.). *Class II.*—Forbes and Parlee, equal; Kemp, Chambers, Atkinson ; McDougall and Wurtele, equal ; Kent ; Davis and McMurtry and Pippy, equal ; Carlyle and Taylor, equal. *Class III.*—Ells and Wenger, equal ; Mundy, Piche, Sullivan, Cardew ; Cole (G. E.) and Cameron and Gnaedinger and Roffey, equal ; Beaubien and Dawe, equal ; Grice, Wisdom, Campbell, Hamilton (W.), Greey and Hamilton (A. M.) and Hogan and McCarthy and McIntyre and Sutherland and Webster and Wilson, equal.

SPECIAL EXAMINATION.—*Class I.*—Harris (S. L. D.).

FIRST YEAR.—*Class I.*—Johnstone, Fysche, Jewett ; Archibald and Macnab, equal ; Boyle, Cropper ; Livingston and Pattison, equal ; McLeish, Burpee, Churchill ; Blanchet and Drinkwater, equal ; Jost and Scouler, equal ; Wheaton, Willard ; Blackadar and Glassco and McIntosh, equal ; Cram, Frame.

Class II.—Mooney and Redpath, equal ; McLean, Kydd, MacDermot, Ross ; Bowness and McLachlin and Wright, equal ; Sharpe, Robertson, Gibbs ; Campbell and Dickson, equal ; Barclay ; Bélanger and Idsardi, equal ; Lemoine. *Class III.*—Eadie and Turnbull, equal ; Cockshutt, Miner, Sutcliffe, Roger, Cunha ; Bain and Greenshields and MacFarlane and Pinch and Ritchie and Robb and Skelton and Young, equal.

SPECIAL EXAMINATION.—*Class II.*—Harris (A. D).

DESIGNING.

FOURTH YEAR (*Civil Engineering Course*).—*Class I.*—Heaman; Bigger and Borden and Cameron, equal; Shaw. *Class II.*—Sparrow. (*Electrical Engineering Course*)—*Class I.*—Hicks and Scott and Smith, equal; Dunfield and Franklin and Murphy, equal; Jackson and Maxwell and MacKay (E.), equal; *Class II.*—None. *Class III.*—None. (*Mechanical Engineering Course*).—*Class I.*—Sterns. *Class II.*—Fry and Newton and Smith, equal; Addie, Baird. .....

DYNAMICS OF MACHINES.

FOURTH YEAR.—*Class I.*—Sterns, Smith. *Class II.*—Fry and Newton, equal; Addie and Baird, equal.

THIRD YEAR.—(*Electrical Engineering Course.*)—*Class I.*—Foreman, Conklin. *Class II.*—Keith, Stokes, Peaslee. *Class III.*—Blatch; Baker and McDonald, equal; Cole and McCaskill and Rodger and Thorpe, equal; Trimingham, James. (*Mechanical Engineering Course.*)—*Class I.*—Roberts, McKay. *Class II.*—Brown, McKergow.

ELECTRIC LIGHTING.

FOURTH YEAR.—*Class I.*—Dunfield. *Class II.*—Boyd and Scott, equal; Franklin; Hicks and Higman, equal. *Class III.*—MacKay, Jackson, Smith (J.M.); Forman and Maxwell and Murphy, equal.

ELECTRICAL MEASUREMENTS.

FOURTH YEAR.—*Class I.*—Franklin and Scott (H.B.), equal; Dunfield and Hicks and MacKay, equal. *Class II.*—Jackson, Smith (J.M.), Maxwell, Murphy.

THIRD YEAR.—*Class I.*—Foreman. *Class II.*—Keith; Conklin and McDonald, equal; Cole (G. P.), Baker, McCaskill. *Class III.*—Stokes, Thorpe, Rodger, Peaslee; Trimingham and Blatch, equal; James.

ELECTRO-METALLURGY.

FOURTH YEAR.—*Class I.*—Corless, DePencier. *Class II.*—Campbell, McBride; Coulson and Maclaren, equal; Burchell.

ELECTRIC RAILWAYS.

FOURTH YEAR.—*Class I.*—Franklin, Dunfield, Scott, Maxwell. *Class II.*—Smith, Murphy, Hicks, Jackson, MacKay (E.).

ELECTRO-CHEMISTRY.

FOURTH YEAR.—*Class I.*—Scott. *Class II.*—Maxwell; Franklin and Mackay, equal. *Class III.*—Dunfield and Hicks, equal; Jackson and Smith, equal.

ELECTRO-MAGNETISM.

THIRD YEAR.—*Class I.*—McDonald, James. *Class II.*—Foreman; Cole and MacCaskill, equal; Rodger, Blatch, Stokes. *Class III.*—Thorpe, Trimingham, Baker, Keith, Conklin; Peaslee and Scott, equal.

ENGLISH.

FIRST YEAR.—*Class I.*—Boyle and Jewett, equal; Campbell, Kydd, Blanchet, Scouler; Glassco and Wheaton, equal; Fyshe and McLeish, equal. *Class II.*—McIntosh, Pattison, Burpee; Frame and MacDermot, equal; Cram and Macnab, equal; Archibald and Johnstone and Willard, equal; Drinkwater; Bowness and Jost, equal; Blackadar and Churchill, equal; Cunha and Roger, equal; Livingston and McLachlin, equal; Redpath; Cropper and Ritchie equal. *Class III.*—Robertson; Idsardi and Ross and Young, equal; Small; Cockshutt and Miner and Mooney, equal; Bain and Pinch, equal; Wright; Eadie and Waterous, equal; Turnbull, Belanger, Gibbs, Ryan, Sharpe.

ENGLISH SUMMER READING.

SECOND YEAR.—*Class I.*—Carlyle, Roffey, Rowland. *Class II.*—Blumenthal, Hogan; Cole (G.H.) and Drysdale, equal; Davis and McPhee, equal; Harvey and Webster, equal; Fraser (D.M.) and Johnstone, equal; Tilt, Parlee; Baker (C.S.) and Cardew and Higgins, equal; Dutcher, McCloskey; Baker (W.E.) and Wilkes, equal; Dawe. *Class III.*—Ross, Ward; Fullington and Lawrence and McCaskill, equal; Kemp; Piche and Sullivan, equal; LeMaistre and McDougall (G.K.), equal; Taylor; Hodgson and Marrotte, equal; Cohen, Greey, Hamilton (A.M.); Thorpe and Wilson, equal; Barclay and Mundy and Rodger and Keyes, equal.

FREEHAND DRAWING.

FIRST YEAR.—*Class I.*—Pinch, Drinkwater, Robb (F.G.); Churchill and Eadie and Pattison, equal; Cram; Harris and Jost and McLean, equal. *Class II.*—Cropper; Boyle and Jewett, equal; Archibald; Blanchet and Robertson, equal; Burpee and Lemoine, equal; Greenshields and Mackay, equal; Wheaton, Livingston; Belanger and Frame and Glassco and MacDermot and McLeish, equal. *Class III.*—Mooney and Turnbull, equal; Macnab and Shaughnessy, equal; Idsardi and Johnstone and Ross, equal; Campbell and Cunha and McIntosh and Robb (R.W.), equal; Bowness and Jardine and Prevost and Wright, equal; Blackadar and Gibbs and McLachlin and Rodger and Skelton and Williamson, equal; Ritchie and Small and Willard, equal; Cockshutt and Kydd and Pillow, equal; Miner and Redpath and Rolland and Young, equal; Fyshe.

GAS ANALYSIS.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Labatt, Canning. *Class III.*—Cape.

GEODESY.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Heaman, Shaw, Bigger, *Class III.*—Borden, Cameron.

GEODETIC FIELDWORK.

FOURTH YEAR.—(*Civil Engineering Course*)—*Class I.*—Heaman, Bigger. *Class II.*—Borden, Cameron. *Passed* Shaw.

GEOLOGY.

THIRD YEAR.—*Class I.*—Hall. *Class II.*—Rowlands, Lucas, Egleson; Gale and Musgrave (W.N.), equal; Pemberton, Boright; Jones and Rowley, equal; Haffner, Ross, Stovel, Kendall. *Class III.*—Musgrave (R.), Savage, Langley, Richards, Tilt, Carter, Maclaren, Beck, Cohen, Landry.

GEOLOGY AND ORE DEPOSITS.

FOURTH YEAR.—*Class I.*—Corless, De Pencier. *Class II.*—Campbell, McBride, Coulson. *Class III.*—Burchell and Maclaren, equal.

GRAPHICAL STATICS.

FOURTH YEAR.—*Class I.*—Cameron and Heaman, equal; Borden and Shaw, equal. *Class II.*—Bigger, Sparrow.

THIRD YEAR.—*Class I.*—Foreman, Boright, Stokes, Roberts, McKay; Brown and Hall, equal; Gale and Stovel, equal. *Class II.*—Conklin, McKergow, Lucas, Cole (G. P.), Pemberton, Cohen, McCaskill, Kendall, Keith; Baker and Rodger, equal; Haffner; Jones and Musgrave (R.), equal; Rowley and Thorpe, equal. *Class III.*—Richards, Langley; Blatch and McDonald and Scott, equal; Beck, Rowlands, Brainerd; Peaslee and Ross, equal; Landry, Tilt, Cameron; James and Trimingham, equal.

HYDRAULICS.

FOURTH YEAR.—(*Civil and Mechanical Engineering Courses.*)—*Class I.*—Sterns, Smith (C. M.). *Class II.*—Heaman, Shaw, Bigger. *Class III.*—Addie and Borden, equal; Baird; Cameron and Fry and Newton, equal. (*Electrical and Mining Engineering Courses*).—*Class I.*—Corless. *Class II.*—Scott; DePencier and Maxwell, equal; Franklin. *Class III.*—MacKay, McBride, Dunfield; Coulson and Jackson and Murphy and Smith (J. M.), equal; Maclaren (G. M.); Campbell and Hicks, equal; Edgar and Burchell, equal.

HYDRAULIC MACHINERY.

FOURTH YEAR.—*Class I.*—Sterns; Heaman and Corless, equal; Scott. Smith (G.M.). *Class II.*—Hicks and Maxwell, equal; Dunfield and Franklin, equal; Addie, Cameron; Jackson and MacKay, equal; Bigger and Newton, equal; Baird, Fry. *Class III.*—Burchell and Murphy, equal; DePencier, Borden, Shaw; Campbell and Smith (J.M.), equal; McBride, Coulson.

KINEMATICS OF MACHINES.

SECOND YEAR.— *Class I.*—Wurtele. *Class II.*—McDougall (G.K.), Cole (G.H.), Chaplin, McCloskey; Fraser and Pippy, equal; Marrotte, Cardew, Wenger, Kemp. *Class III.*—Drysdale, Mundy, Wilkes; Devlin and Greey and Price, equal; Piché, Roffey, Beaubien.

LABORATORIES.

FOURTH YEAR.—(*Chemical Laboratory*)—*Electrical Engineering Course.*)—*Class I.*—Scott. *Class II.*—Maxwell and Smith (J.M.), equal; Dunfield and Franklin, equal; Murphy; Hicks and McKay, equal. *Class III.*—Jackson. (*Mining Engineering Course.*)—*Class I.*—Corless. *Class II.*—Canning, DePencier. *Class III.*—McBride, Campbell, Porcheron, Burchell, Coulson. (*Chemistry Course.*)—*Class I.*—None. *Class II.*—Labatt.

THIRD YEAR.—(*Chemical Laboratory*)—(*Mining Engineering Course.*)—*Class I.*—Lucas and Pemberton and Stovel, equal; Hall. *Class II.*—Boright and Rowlands, equal; Gale and Tilt, equal; Rowley; Langley and Ross, equal; Musgrave (R.); Kendall and Richards, equal. (*Chemistry Course.*)—*Class I.*—Egleson and Lodge and Musgrave (W.N.), equal. *Class II.*—Savage. *Class III.*—Crawford.

FOURTH YEAR.—(*Electrical Laboratory.*)—*Class I.*—Scott and Franklin and Smith (J M.), equal; Dunfield and Hicks and Jackson, equal; MacKay, Maxwell and Murphy, equal.

THIRD YEAR.—(*Electrical Laboratory.*)—*Class I.*—Cole (G.P.), McCaskill; Conklin and Keith and Foreman, equal. *Class II.*—McDonald; James and Peaslee, equal; Trimingham. *Class III.*—Stokes, Thorpe, Baker; Blatch and Rodger, equal; Scott.

THIRD YEAR.—(*Electrical Engineering Laboratory.*)—*Class I.*—Cole (G.P.); McCaskill; Conklin and Foreman and Keith, equal. *Class II.*—McDonald; Bertram and Peaslee, equal; Trimingham. *Class III.*—Stokes, Thorpe, Baker; Blatch and Rodger, equal; Scott.

FOURTH YEAR.—(*Geodetic Laboratory.*)—*Class I.*—Heaman, Bigger, Cameron; Borden and Shaw, equal. *Class II.*—Sparrow.

FOURTH YEAR.—(*Hydraulic Laboratory.*)—*Class I.*—Corless and Fry and Heaman and Scott and Sterns, equal; De Pencier; Franklin and Smith (G.M.), equal. *Class II.*—Bigger and Shaw, equal; Maxwell and Newton, equal; Borden and Jackson and Smith (J. M.), equal; Baird and Cameron and Edgar, equal; Campbell and Coulson and Murphy and McBride, equal. *Class III.*—Addie and Dunfield and Hicks and McKay, equal; McLaren (G. M.), Sparrow, Burchell.

FOURTH YEAR.—(*Mechanical Engineering Laboratory.*)—*Class I.*—Sterns, Smith, Newton. *Class II.*—Fry; Addie and Baird, equal.

FOURTH YEAR.—(*Mining and Metallurgical Laboratory.*) *Class I.*—Corless, De Pencier. *Class II.*—Burchell; Campbell and McBride, equal. *Class III.*—Coulson, Maclaren.

SECOND YEAR.—(*Physical Laboratory.*)—(*Civil, Mechanical, Mining and Chemistry Courses.*) *Class I.*—Atkinson and Blumenthal and Campbell (C. G.) and Dawe and Drysdale and Dutcher and Harvey and Kent and Lawrence and MacCarthy and MacNaughton and McDougall (C. H.) and McIntyre and McMurtry and Parlee and Sullivan, equal; Hamilton (W.) and McPhee and Taylor, equal; Chaplin and Fraser (D. M.), equal; Hamilton (A. M.) and Johnson, equal; Cole (G. E.) and Ells and Lockerby and Martin and Wilson, equal; LeMaistre. *Class II.*—Barclay and Davis, equal; Carlyle and Forbes and Gnaedinger and Harris (S. L. D.) and Hogan and Webster and Wilkes, equal; Kemp, Chambers; Crichton and Greey and Grice, equal. *Class III.*—Baker (C. S.), Morrison, Pippy, Wisdom, Molson. (*Electrical Engineering Course.*) *Class I.*—Cole (G. H.) and McCloskey, equal; McDougall (G. K.); Fullington and Wenger, equal; Cardew and Piche, equal; Wurtele, Marrotte, Devlin, Roffey. *Class II.*—Price, Beaubien; Batchelder and Joseph, equal; Mundy. *Class III.*—Higgins.

FIRST YEAR.—(*Physical Laboratory.*) (Alphabetical Order.) Archibald, Bain, Belanger, Blackader, Blanchet, Bowness, Boyle, Burpee, Campbell, Churchill, Cockshutt, Cram, Cropper, Cunha, Davies, Dickson, Drinkwater, Eadie, Frame, Fyshe, Gibbs, Glassco, Greenshields, Hodgson, Idsardi, Jewett, Johnstone, Jost, Kydd, Livingstone, MacDermot, MacFarlane, Macnab, McIntosh, McLachlin, McLean, McLeish, Miner, Mooney, Pattison, Pillow, Pinch, Reaume, Redpath, Ritchie, Robb, Robertson, Robitaille, Roger, Rolland, Ross, Ryan, Scouler, Sharpe, Sutcliffe, Small, Turnbull, Waterous, Wheaton, Willard, Wright, Young.

FOURTH YEAR.—(*Testing Laboratory.*)—*Class I.*—None. *Class II.*—Cameron and Shaw, equal; Bigger and Borden and Heaman, equal. *Class III.*—Sparrow.

THIRD YEAR.—(*Testing Laboratory.*) (*Civil and Mining Engineering Courses.*) *Class I.*—Hall, Boright; Gale and Lucas, equal. *Class II.*—Jones (H. W.), Musgrave; Kendall and Rowlands, equal; Richards and Rowley and Tilt, equal; Stovel; Pemberton and Langley, equal; Landry. *Class III.*—Ross, Brainerd, Cohen. (*Electrical and Mechanical Engineering Courses.*) *Class I.*—Roberts; McKay and Conklin, equal; Foreman, Brown, Keith. *Class II.*—Baker and Stokes, equal; Cole and Scott, equal; McDonald and McCaskill, equal; Peaslee, Blatch; Rodger and Thorpe, equal; McKergow and Trimingham, equal; James.

LETTERING.

FIRST YEAR.—*Class I.*—Jost, Blanchet, Cropper, Turnbull; Burpee and Churchill and Fyshe and Pattison and Robb (F. G.), equal; Frame and Jewett and Kydd and MacDermot and McLean, equal; Boyle and Cram, equal; Glassco. *Class II.*—Drinkwater and Johnstone and Ross, equal; Archibald and Cunha and Miner, equal; Mackay; Belanger and Mooney, equal; Campbell and Harris (A. D.) and McLeish and Ritchie and Willard and Wright, equal; Livingston; Bowness and MacFarlane and Pinch and Wheaton, equal; Blackadar and Greenshields and Idsardi and McIntosh, equal; Cockshutt and Dickson and Gibbs and Young, equal; Redpath. *Class III.*—Eadie and Lemoine and Macnab, equal; Small; Jardine and Rodger and Scouler, equal; McLachlin and Ryan, equal; Waterous; Bain and Robertson, equal; Pillow.

MACHINE DESIGN.

FOURTH YEAR.—(*Electrical Engineering Course.*) *Class I.*—None. *Class II.*—Scott, MacKay (E.), Franklin, Hicks. *Class III.*—Maxwell, Jackson, Dunfield; Forman and Murphy and Smith, equal. (*Mechanical Engineering Course.*) *Class I.*—Sterns. *Class II.*—Fry, Addie. *Class III.*—Smith, Newton, Baird.

THIRD YEAR.—(*Electrical and Mining Engineering Courses.*) *Class I.*—Foreman. *Class II.*—Conklin. *Class III.*—Keith; Blatch and McCaskill, equal; Peaslee and Rodger, equal; McDonald and Thorpe, equal; Ross and Rowlands, equal; Hall and Rowley and Stokes, equal; Kendall; Baker and Boright and Cole and Lucas and Stovel and Tilt, equal. (*Mechanical Engineering Course.*) *Class I.*—Roberts. *Class II.*—Brown, McKay, Edgar. *Class III.*—McKergow.

MAPPING.

THIRD YEAR.—*Class I.*—Jones. *Class II.*—Haffner, Cohen, Landry.

SECOND YEAR.—(*Civil Engineering Course.*) *Class I.*—Harvey. *Class II.*—Hamilton (W.), Kent, Blumenthal, Hogan. *Class III.*—Lawrence, Dawe. (*Mining Engineering Course.*) *Class I.*—Gnaedinger, McDougall (C. H.) *Class II.*—Chambers, Harris; Dutcher and Parlee, equal; Carlyle; Baker and Ells, equal; Forbes; McPhee and Sullivan and Wisdom, equal. *Class III.*—Atkinson and McMurtry, equal; Davis and Hamilton (A. M.), equal; Campbell and McIntyre, equal; Crichton, Grice; Sutherand and Taylor and Webster and Wilson, equal; Cole (G. E.) and Martin, equal.

MATHEMATICS.

THIRD YEAR.—(*Calculus, etc.*).—*Class I.*—Lucas and Roberts, equal; Foreman and Hall, equal; Haffner, Rowlands, Brown. *Class II.*—Gale, Jones, Conklin, Thorpe, Stovel, McKergow, Landry. *Class II.*—Tilt, Trimingham; McDonald and Ross, equal; Beck, Cohen, Rodger, Pemberton, Musgrave (R.); Edgar and McKay, equal; Blatch and Richards and Stokes, equal; Brainerd and Scott, equal; James, Langley; Boright and Kendall, equal; Keith. (*Mechanics*)—*Class I.*—Forbes and Jones and Roberts, equal; Conklin, Pemberton; Boright and Lucas, equal; Brown, Rowlands. *Class II.*—Keith; Blatch and Gale and Hall, equal; Musgrave (R.) and Stokes, equal; McKay, Stovel; Richards and Rodger, equal; Kendall. *Class III.*—Langley, Beck; McDonald and Peaslee, equal; Landry and Maclaren (F. H.), equal; Tilt, Trimingham, Cole (G. P.); McCaskill and McKergow and Porcheron and Ross and Scott and Thorpe, equal.

SPECIAL EXAMINATION:—(Haffner, passed.)

SECOND YEAR—(*Analytical Geometry*).—*Class I.*—Dutcher and Forbes, equal; Chaplin and McCloskey, equal; Blumenthal and Cole (G. H.) and McPhee, equal; Harris (S. L. D.) and Harvey and Lawrence and Wenger, equal. *Class II.*—Joseph, Lambart, Grice, Atkinson, Marrotte, Davis, Cardew; Cole (G. E.) and McNaughton, equal; McDougall (C. H.), Kent; Chambers and Greey and Sullivan, equal. *Class III.*—Devlin, Parlee, McDougall (G. K.); LeMaistre and MacCarthy, equal; Carlyle and Drysdale, equal; Dawe, Wisdom, Mathers; Johnson and Kemp and Mundy, equal; Ells, Taylor, Molson, Campbell; Fullington and Hamilton (W.) and Hogan and Webster, equal; Martin. (*Calculus*)—*Class I.*—Lawrence, Blumenthal, Harris (S. L. D.), Dutcher, Forbes, McPhee; Cardew and Harvey, equal; McCloskey, Parlee. *Class II.*—Cole (G. H.); Chaplin and McDou-

gall (C. H.) and Wenger, equal; Atkinson, Cole (C. E.); Drysdale and Grice, equal; MacNaughton, Sullivan, McDougall (G. H.), Greey, Fullington, Johnson. *Class III.*—Chambers and MacCarthy, equal; Taylor, Roffey, Wilkes, Gnaedinger, Kent; Carlyle and Webster, equal; Pippy; Ells and Marrotte, equal; LeMaistre; Devlin and Kemp, equal. *Mechanics.*—*Class I.*—Davis; Blumenthal and Lawrence, equal. *Class II.*—McPhee; Dutcher and McCloskey, equal; Chaplin and Cole (G. H.), equal; Harris (S. L. D.) and McDougall, (G. K.), equal; Harvey, Cardew, Kent, Forbes, McDougall (G. H.); Chambers, and Webster, equal. *Class III.*—Carlyle; Parlee and Taylor, equal; Atkinson and Hogan, equal; Johnson and McMurtry, equal; Ells and Fullington and Greey, equal; Cole (G. E.) and Wenger, equal; Sullivan, Kemp; Drysdale and Piché and Wisdom, equal; Wurtele, Roffey, Grice, Gnaedinger, Price, Devlin; Dawe and LeMaistre and McNaughton and Marrotte and Mundy, equal.

FIRST YEAR—(*Algebra*).—*Class I.*—MacDermot; Blanchet and Boyle, equal; Willard, Campbell; Fyshe and Jewett and McLeish, equal; Cropper and Jost, equal; McLean; Archibald and Glassco and Johnstone and Scouler, equal; Cunha and Kydd and Sharpe, equal; Cockshutt and Macnab, equal; Ross. *Class II.*—Pattison and Turnbull, equal; Bowness and Drinkwater, equal; Blackadar and Churchill and Livingston and Young, equal; Redpath, Wheaton, Cram; Miner and Mooney, equal; McIntosh, Wright, Ryan. *Class III.*—Belanger, Robertson, Roger, Burpee, Hodgson, Sutcliffe; Pinch and Small, equal; Frame and Ritchie, equal; Shaughnessy; Robb (R. W.) and Sutherland, equal. (*Dynamics*).—*Class I.*—Boyle, Jewett, Johnstone, McLeish; Archibald and Campbell, equal; Burpee and Cunha and Pattison and Redpath, equal; Willard; Fyshe and Scouler, equal; Bowness and Churchill, equal; Cockshutt and Wheaton, equal; MacDermot, Macnab. *Class II.*—Glassco Livingston, Miner, Turnbull, Belanger; Blanchet and Jost and McLean, equal; Mooney, Cropper; Kydd and Sharpe, equal; Blackadar. *Class III.*—Young, Pinch; Beaubien and Wright, equal; Robertson, McIntosh; Cram and Gibbs equal; Ross and Ryan, equal; Ritchie. (*Geometry*)—*Class I.*—Fyshe and Jost, equal; Archibald and Boyle, equal; Blanchet, Glassco, Jewett; Churchill and Johnstone, equal; Bowness and Redpath, equal; McLeish, Macnab; Cropper and Willard, equal; Scouler, MacDermot, Blackadar; Livingston and McLean, equal. *Class II.*—Drinkwater and Kydd, equal; Pattison, Wheaton Cram; Frame and McIntosh, equal; Cunha, Turnbull, Burpee, Wright. *Class III.*—†Small, Sutherland, Bain, Mooney, †Belanger, *Ritchie; Idsardi and Ross, equal; Robertson and Young, equal; *Campbell; *Eadie and *Ryan, equal; Miner and *Sharpe, equal; †Barclay and *Rolland, equal; Cockshutt and Pinch, equal. (*Trigonometry*)—*Class I.*—Boyle, Campbell, Blanchet, Johnstone, Scouler, MacDermot, Willard, Glassco. *Class II.*—Cropper and Livingston, equal; Fyshe; Cunha and Drinkwater, equal; McLeish; Jewett and Ross, equal; Archibald, Bowness, Redpath; Jost and Wheaton, equal; Kydd, Small; Macnab and Wright, equal; Pattison. *Class III.*—Gibbs and Shaughnessy, equal; Sharpe; Cockshutt and McLean and Miner and Mooney, equal; Young, Turnbull, Ritchie; Blackadar and McIntosh and Robertson, equal; Hodgson, Belanger, Eadie; Churchill and Robb (R. W.) and Ryan, equal; Barclay; Burpee and Cram and Frame and Pinch, equal.

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* *Supplemental in Plane Geom.*
† *Supplemental in Solid and Conics.*

MECHANICAL DRAWING.

THIRD YEAR.—(*Electrical and Mining Engineering Courses.*)—*Class I.*—None. *Class II.*—Gale, Foreman, Peaslee, Hall, Kendall, Stokes. *Class III.*—Boright and Cole (G.P.) and Stovel and Scott, equal; Lucas and McCaskill and Thorpe, equal; James; Baker (W.E.) and Keith and Ross, equal; Blatch and Langley and Rodger and Tilt, equal; Conklin, Musgrave (R.); McDonald and Richards, equal; Pemberton and Trimingham, equal. (*Mechanical Engineering Course.*)—*Class I.*—Roberts, McKergow, McKay. *Class II.*—Brown.

SECOND YEAR.—(*Electrical and Mining Engineering Courses.*)—*Class I.*—None. *Class II.*—Chambers, Harris, McDougall (G.K.); Cole (G.H.) and Marrotte and Mundy and Piche, equal. *Class III.*—Carter and Gnaedinger and McDougall (C.H.), equal; Dutcher and Wurtele, equal; Beaubien and Grice and Lambart, equal; Forbes and McPhee and Parlee and Wenger, equal; Cardew and Davis and Hamilton and McMurtry, equal; Higgins and McCloskey, equal; Anderson and Crichton and Roffey and Sullivan, equal; McIntyre; Carlyle and Rowley and Webster and Wilson and Wisdom, equal; Atkinson and Devlin and Ells and Fullington and Taylor, equal. (*Mechanical Engineering Course.*)—*Class I.*—None. *Class II.*—Chaplin, Kemp, Wilkes, Pippy, Drysdale, Fraser (D.M.). *Class III.*—Greey, Fraser (T.C.), McCarthy.

MECHANICAL ENGINEERING.

FOURTH YEAR.—(*Civil, Electrical and Mining Engineering Courses.*)—*Class I.*—Heaman, Maxwell. *Class II.*—Bigger; Corless and De Pencier and McBride and Scott, equal; Dunfield; Campbell and Carter and Hicks and Smith (J. M.), equal; Franklin, Borden, Jackson. *Class III.*—Shaw; Cameron and Mackay (E.), equal; Murphy, Burchell, Coulson. (*Mechanical Engineering Course.*)—*Class I.*—Sterns. *Class II.*—Smith (G. M.), Fry. *Class III.*—Addie, Newton, Baird.

MECHANISMS.

SECOND YEAR.—*Class I.*—McPhee; Blumenthal and Harvey, equal; Chambers, Carlyle; Forbes and Lawrence and McIntyre, equal; Parlee, Sullivan. *Class II.*—Ells and Lambart, equal; Harris, Gnaedinger, Hamilton (W.), Kent; Crichton and Hamilton (A. M.) and Hogan and Wilson, equal; Wisdom. *Class III.*—Campbell; Anderson and Dawe and McMurtry and Taylor, equal; Davis, McDougall (C. H.); Cole and Webster, equal; Martin.

METALLURGY.

THIRD YEAR.—*Class I.*—Lodge, Lucas (A.S.B.), Boright; Carter and Egleson, equal. *Class II.*—Musgrave (W.N.) and Pemberton, equal; Langley and Ross, equal; Gale and Hall and Rowlands and Tilt, equal; Maclaren; Musgrave (R.N.) and Rowley, equal; Kendall and Richards, equal; Brainerd and Savage, equal; Cameron and Crawford, equal. *Class III.*—Stovel, Porcheron.

METALLURGY (ADVANCED).

FOURTH YEAR.—*Class I.*—Corless, DePencier. *Class II.*—McBride, Coulson. *Class III.*—Maclaren; Burchell and Campbell, equal.

METALLURGY (IRON, STEEL AND ALLOYS).

FOURTH YEAR.—*Class I.*—Corless and Sterns, equal. *Class II.*—McBride, DePencier, Roberts (J. R.), Campbell. *Class III.*—Smith; Coulson and Edgar and Newton, equal; Fry, Burchell, Addie; Maclaren and Baird, equal.

MINERALOGY.

THIRD YEAR.—*Class I.*—Rowlands, Hall, Egleson. *Class II.*—Lucas, Musgrave (W. N.), Rowley, Pemberton, Carter, Savage, Gale. *Class III.*—Boright and Crawford and Stovel, equal; Porcheron, Maclaren (F. H.), Kendall, Tilt; Cape and Musgrave (R.), equal; Langley, Brainerd.

MINERALOGY (ADVANCED).

FOURTH YEAR.—*Class I.*—Corless; Campbell and De Pencier, equal. *Class II.*—Canning. *Class III.*—McBride, Maclaren, Labatt, Coulson, Burchell.

MINERALOGY (DETERMINATIVE).

THIRD YEAR.—*Class I.*—Musgrave (W. N.), Hall and Rowley and Tilt, equal; Rowlands. *Class II.*—Boright and Egleson, equal; Lucas and Pemberton, equal; Carter and Gale and Kendall, equal; Ross; Langley and Richards, equal; Musgrave (R.) and Stovel, equal. *Class III.*—Brainerd, Savage, Crawford.

MINING.

FOURTH YEAR.—*Class I.*—Corless and De Pencier, equal. *Class II.*—Campbell. *Class III.*—Coulson, Maclaren, Burchell, McBride.

MINING DESIGN AND COLLOQUIA.

FOURTH YEAR.—*Class I.*—De Pencier. *Class II.*—Corless, McBride, Campbell, Burchell. *Class III.*—Maclaren, Coulson.

MINING MACHINERY.

FOURTH YEAR.—*Class I.*—Corless. *Class II.*—De Pencier, Coulson, McBride. *Class III.*—Burchell, Maclaren, Campbell.

MUNICIPAL ENGINEERING.

THIRD AND FOURTH YEARS.—*Class I.*—Heaman, Borden. *Class II.*—Bigger, Shaw, Jones, Cohen. *Class III.*—Cameron and Beck, equal; Sparrow, Landry.

MUSEUM WORK IN GEOLOGY.

THIRD YEAR.—*Class I.*—Hall; Egleson and Musgrave (W. N.), equal. *Class II.*—Langley; Jones and Pemberton, equal; Boright and Gale, equal; Haffner and Musgrave (R.) and Stovel, equal; Beck and Crawford and Kendall and Lucas and Rowlands and Tilt, equal; Carter and Maclaren and Rowley, equal. *Class III.*—Landry and Savage, equal; Cohen and Ross, equal; Brainerd and Richards, equal.

ORE DRESSING.

FOURTH YEAR.—*Class I.*—Corless, De Pencier. *Class II.*—Campbell, McBride, Coulson. *Class III.*—Burchell, Maclaren (G. M.)
THIRD YEAR.—*Class I.*—Lodge and Ross, equal; Boright. *Class II.*—Gale and Rowlands, equal; Hall, Tilt, Lucas, Rowley; Brainerd and Carter and Kendall and Pemberton, equal. *Class III.*—Musgrave (R.), Richards; Cameron and Egleson and Langley, equal; Stovel.

PERSPECTIVE AND MAPPING.

THIRD YEAR.—(*Civil Engineering Course.*) *Class I.*—None. *Class II.*—Lambart, Jones, Beck. *Class III.*—Cohen, Landry.

PHYSIOGRAPHY.

FOURTH YEAR.—*Class I.*—None. *Class II.*—None. *Class III.*—Canning.

PHYSICS.

SECOND YEAR.— (*Electricity and Magnetism.*) *Class I.*—Blumenthal, Harris, McCloskey, Lawrence; Cardew and Grice, equal; McDougall (G. K.) *Class II.*—Harvey and Kent, equal; Cole (G. H.), Mundy; Forbes and McPhee, equal; Dutcher; Johnson and Kemp and MacNaughton and Marrotte and Wenger, equal; Atkinson, Devlin; Drysdale and Ellis, equal; Webster; Fullington and Greey and Hogan and Price, equal. *Class III.*—McDougall (C. H.), Chaplin, Chambers; Joseph and LeMaistre, equal; Roffey; McMurtry and Wilkes, equal; Taylor, Parlee; Fraser and Wisdom, equal; Campbell and Lambart, equal; Carlyle; Dawe and Gnaedinger and Maclaren (F. H.), equal; Batchelder and Pippy, equal; Wurtele, Martin; Cole (G. E.) and Davis and MacCarthy and Sullivan and Wilson, equal.
FIRST YEAR.—(*Sound, Heat and Light.*) *Class I.*—Blanchet and Scouler, equal; Boyle and McLean, equal; Fyshe; Johnstone and McDermot, equal; McLeish, Jewett; Cropper and Willard, equal; Jost, Archibald, Livingstone; Kydd and Pattison, equal; Churchill, Bowness; Cunha and Drinkwater and McIntosh, equal. *Class II.*—Campbell and Wheaton, equal; Burpee and Glassco and Ross, equal; Mooney, Robertson; Macnab and Wright, equal; Sharpe, Redpath. *Class III.*—Cockshutt, Blackadar, Miner, Cram, Eadie, Belanger, Turnbull; Frame and Hodgson and Ryan, equal; Gibbs, Pinch; Greenshields and McLachlin and Rodger; Bain, Small; Dickson and Ritchie; Idsardi, Young.

ROADS AND CANALS.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Heaman, Shaw, Cameron. *Class III.*—Borden, Bigger, Sparrow.
THIRD YEAR.—*Class I.*—None. *Class II.*—None. *Class III.*—Jones, Beck, Cohen.

SHOPWORK.

FOURTH YEAR.— *Class I.*—Baird, Addie, Sterns; Newton and Smith (G. M.), equal; Fry. *Class II.*—Edgar.
THIRD YEAR.—(*Electrical Engineering Course*).—*Class I.*—Keith. *Class II.*—Foreman, McCaskill; Cole and Conklin and Peaslee, equal; Rodger and Thorpe, equal; James and McDonald and Stokes, equal. *Class III.*—Baker, Trimingham, Blatch, Scott. (*Mechanical Engineering Course*)—*Class I.*—McKergow. *Class II.*—Brown and McKay, equal; Roberts (A. R.).

SECOND YEAR.—(*Civil and Mining Engineering Courses*).—*Class I.*—McIntyre and McPhee and Parlee, equal; Atkinson and Dawe and Hamilton (A.M.) and Hodgson, equal; Gnaedinger and Hamilton (W.) and Kent, equal; Chambers, Crichton and Harvey, equal; Campbell and Martin, equal. *Class II.*—Cole (C. E.) and Lambart and Taylor, equal; Baker and Forbes and Wilson, equal; Blumenthal and Lawrence, equal; Carlyle and McMurtry and Webster and Wisdom, equal; Davis and Dutcher, equal. *Class III.*—McDougall (C. H.); Ells and Sullivan and Sutcliffe, equal. (*Electrical and Mechanical Engineering Courses*)—*Class I.*—Cole, (G. H.), Wenger. *Class II.*—Drysdale and McCloskey, equal; Devlin and Fraser (T. C.) and Kemp, equal; Fullington and McDougall (G. K.), equal; Chaplin and Marrotte, equal; Anderson; Batchelder and Cardew and Mundy and Piché and Price and Würtele, equal; Beaubien and Greey, equal; Fraser (D.M.). *Class III.*—Wilkes, Pippy, Barclay, Roffey.

FIRST YEAR.—*Class I.*—Burpee. *Class II.*—Wheaton; Archibald and Cropper and Pattison, equal; Frame and Mackay and Macnab and Mooney and Redpath and Gnaedinger, equal; Blackadar and Boyle and Cram and Fyshe and Idsardi and Jewett and Johnstone and Jost and McIntosh and McLean and Miner and Pillow, equal; Bowness and Churchill and MacDermot and Pinch and Willard and Young and Lemoine, equal; Cockshutt and Drinkwater and Gibbs and Robertson and Molson and Rolland and Ross and Skelton and Small and Wright, equal; Blanchet and Campbell and Glassco and Kydd and McLeish and Robb (F. G.) and Roger and Scouler and Sharpe, equal. *Class III.*—Belanger and Ritchie and Waterous, equal; Jardine and Turnbull, equal; Cunha and Livingston and MacFarlane and McLachlin and Shaughnessy and Williamson, equal; Bain and Eadie, equal; Joseph; Davis and Greenshields, equal; Ryan.

STRUCTURAL DESIGNING.

FOURTH YEAR.—*Class I.*—Heaman. *Class II.*—Bigger, Shaw, Borden. *Class III.*—Cameron, Sparrow.

THIRD YEAR.—*Class I.*—Beck, Haffner, Jones. *Class II.*—Cohen and Landry, equal.

STRUCTURAL ENGINEERING.

FOURTH YEAR.—*Class I.*—Heaman, Shaw. *Class II.*—Cameron, Sparrow; Bigger and Borden, equal.

THIRD YEAR.—*Class I.*—None. *Class II.*—Beck, Jones. *Class III.*—Cohen, Landry.

SUMMER WORK (ESSAYS).

FOURTH YEAR.—*Class I.*—Heaman and Shaw and Smith (G.M.), equal; Campbell and Scott, equal; DePencier and Dunfield, equal; Corless and Sterns, equal. *Class II.*—Borden and Fry, equal; Bigger and Edgar, equal; McBride and Newton, equal; Addie and Jackson and Jamieson, equal. *Class III.*—Smith (J.M.), Hicks; Baird and Burchell and Coulson and Murphy, equal; Cape and MacKay and Maxwell, equal.

THIRD YEAR.—*Class I.*—Jones, Keith; Cole and Conklin and Denne and Hall, equal. *Class II.*—Egleson and Haffner and McKay and McKergow and Roberts and Thorpe, equal; Stovel; Brown and Ross, equal; Cohen and Langley and Laurence and Musgrave (R.) and Richards, equal. *Class III.*—Baker and Lucas, equal; Pemberton and Stokes and Tilt, equal; Foreman and McDonald, equal; Kendall and Peaslee and Rowlands and Scott, equal; Rodger, James; McCaskill and Trimingham, equal; Boright and Graham, equal; Gale and Musgrave (W.N.), equal; Blatch and Sewell and Smith (R.E.), equal.

SURVEYING.

THIRD YEAR.—*Class I.*—None. *Class II.*—Boright, Landry; Jones and Rowley, equal. *Class III.*—Gale and Hall, equal; Lucas, Kendall; Pemberton and Tilt, equal; Richards; Cameron and Ross and Stovel, equal; Musgrave (R.) and Rowlands, equal.

SECOND YEAR.—*Class I.*—Lawrence, Blumenthal, Harris, Forbes; Carlyle and McDougall (C. H.), equal. *Class II.*—Harvey, Dutcher; Kent and McPhee, equal; Davis, Parlee. *Class III.*—Atkinson; Ells and McMurtry, equal; Chambers and Dawe, equal; Campbell and Grice and Hogan and Taylor, equal; Cameron and McIntyre, equal; Gnaedinger and Lambart, equal; Crichton; Baker and Sullivan and Wilson and Wisdom, equal.

SURVEYING (FIELDWORK.)

SECOND YEAR.—*Class I.*—Carlyle and Dutcher and Forbes and Kent and McDougall and McPhee and Parlee, equal. *Class II.*—Blumenthal and Gnaedinger and Hamilton and Wilson, equal; Campbell and Lawrence and McMurtry and Sullivan and Taylor, equal; Atkinson, Harvey. *Class III.*—Baker and Dawe and Hogan, equal; Crichton and Martin, equal; Davis and Wisdom, equal.

THEORY OF STRUCTURES.

FOURTH YEAR.—*Class I.*—Heaman. *Class II.*—Shaw, Borden. *Class III.*—Bigger, Cameron.

THIRD YEAR.—*Class I.*—Foreman, Roberts, Brown; Hall and Lucas, equal. *Class II.*—Conklin, Gale, Rowley, Rowlands, Keith, McDonald, Jones and McCaskill, equal; McKay and Tilt, equal; *Class III.*—Cole (G. P.), Baker, Stokes, Boright, Stovel, Kendall, Richards; Langley and Pemberton and Rodger and Thorpe, equal; Blatch and McKergow, equal; James, Trimingham, Musgrave (R.)

THERMODYNAMICS.

FOURTH YEAR.—(*Mechanical Engineering Course.*)—*Class I.*—Sterns. *Class II.*—Smith, Fry. *Class III.*—Addie; Baird and Newton, equal.

THIRD YEAR.—(*Electrical and Mining Engineering Courses.*)—*Class I.*—Foreman. *Class II.*—None. *Class III.*—Edgar, Lucas; Boright and Cole and Conklin and Hall and Rowlands, equal; Baker and McCaskill, equal; Musgrave and Jones, equal; Gale and Keith and Kendall and Lambart and Langley and Peaslee and Rowley and Stokes and Stovel, equal. (*Mechanical Engineering Course.*)—*Class I.*—Roberts. *Class II.*—McKergow, Brown. *Class III.*—McKay.

THESES.

FOURTH YEAR.—(*Electrical Engineering Course.*)—*Class* .—Smith; Franklin and Scott, equal; Dunfield and Jackson, equal; Hicks and Maxwell and Murphy, equal; MacKay (E.)

TRANSPORTATION.

FOURTH YEAR.—(*Mining Engineering Course.*). *Class I.*—D. Pencier, Corless. *Class II.*—Campbell and McBride, equal; Burchell. *Class III.*—Coulson, Maclaren, Carter, Porcheron.

THIRD YEAR.—(*Mining Engineering Course.*) *Class I.*—Boright. *Class II.* Lucas, Hall, Gale. *Class III.*—Rowley, Stovel, Tilt, Pemberton, Rowlands, Kendall; Richards and Ross, equal; Langley and Musgrave (R.), equal.

Faculty of Medicine.

FINAL YEAR.

PRIZE LIST.

HOLMES GOLD MEDAL, for highest aggregate in all subjects forming the Medical Curriculum.

R. McL. VanWart, B.A., of Fredericton, N.B.

FINAL PRIZEMAN, for highest aggregate in the Fourth Year subjects.

W. A. Gardner, B.A., of Huntingdon, Que.

FIRST YEAR.

HONOURS IN AGGREGATE OF ALL SUBJECTS.

1. VanWart, R. McL., B.A.
2. Gardner, W. A., B.A.
3. Dixon, J. D., B.A.
4. Manchester, J. W.
5. Christie, F. J.
6. Mason, J. LeD.
7. Forster, J. F. C.

SURGERY—HONOURS.

1. VanWart, R. McL., B.A.
2. Christie, F. J.
3. Gardner, W. A., B.A.
4. Morse, W. R., B.A.
5. Moffat, Geo.
   Campbell, A.
7. Colby, J. C., B.A.
   Dixon, J. D., B.A.
9. McGibbon, S.
   Ship, M. L., B.A.
11. Paterson, R. C., B.A.
12. MacKinnon, G. E. L.
13. Halliday, J. LeR.
    Campbell, J. A. E., B.A.
    Forster, J. F. C.
16. Byers, J. R.
17. Mason, J. LeD.
18. Manchester, J. W.
    Johnson, J. A., B.A.

MEDICINE AND CLINICAL MEDICINE.
HONOURS.

1. VanWart, R. McL., B.A.
2. Gardner, W. A., B.A.
3. Dixon, J. D., B.A.
4. Campbell, J. A. E., B.A.
5. Stockwell, H. K.
6. Byers, J. R.
7. Paterson, R. C., B.A.
8. Manchester, J. W.
9. Ship, M. L., B.A.
10. Campbell, A.
11. Colby, J. C., B.A.

CLINICAL SURGERY—HONOURS.

1. VanWart, R. McL., B.A.
2. Moffatt, Geo.
3. Forster, J. F. C.
   Mason, J. LeD., B.A.
5. Campbell, A.
   MacKinnon, G. E. L.
7. Gardner, W. A. B.A.
   Hart, F. W., B.A.
9. Anthony, T. B.
   McGibbon, D.
   Manchester, J. W.
   Morse, W. R., B.A.
13. Christie, F. J.
    Jones, N. C., B.A.

OPHTHALMOLOGY AND OTOLOGY—HONOURS.

1. Gardner, W. A., B.A.
2. Eastman, E. B.
   Manchester, J. W.
4. Byers, J. R.
5. Dixon, W. E., B.A.
6. Green, F. W.
7. Paterson, R. C., B.A.
8. Walker, H., Jr., B.A.

PRACTICAL PATHOLOGY—HONOURS.

1. VanWart, R. McL., B.A.
2. Dixon, J. D., B.A.
3. Manchester, J. W.
4. Mason, J. LeD., B.A.
5. Mothersill, G. S.
6 Baillie, S. A., B.A.
   Campbell, J. A. E., B.A.
   Morse, W. R., B.A.
9 Peters, O. R.
10. Walker, H., Jr., B.A.
11. MacLaren, A. H., B.A.
12. Gardner, W. A., B.A.

GYNAECOLOGY—HONOURS.

1. VanWart, R. McL., B.A.
2. Dixon, J. D., B.A.
3 Walker, H. Jr., B.A.
4. Pickard, L. N.
5 Gardner, W. A., B.A.
6. McGibbon, S.
7. Harris, L. C.
8. Paterson, R. C., B.A.
9. Campbell, J. A. E.
   Mason, J. LeD., B.A.
11. Anthony, T. B.
    Folkins, H. G.
    McNeill, J. F.
14. Hyatt, E. A., B.Sc.
14. Colby, J. C., B.A.
    Forster, J. F. C.
    McKenzie, J. B., B.A.
    Manchester, J. W.
    Moffatt, G.
20. Peters, O. R.
21. Dorion, W. A.
22. Christie, F. J.
23. Leney, J. M., B.A.
    Ship, M. L., B.A.
25. Hopkins, C. W.
26. McGibbon, D.
    Smith, T. W.

OBSTETRICS—HONOURS.

1. VanWart, R. McL., B.A.
2. Hopkins, C. W.
3. Smith, T. W.

PASS LIST.

FINAL SUBJECTS.

The following gentlemen, 82 in number, have fulfilled all the requirements to entitle them to the degree of M.D., C.M., from the University. In addition to the primary subjects they have passed a satisfactory examination, both written and oral, in the following subjects :—Principles and Practice of Surgery, Theory and Practice of Medicine, Obstetrics and Diseases of Women and Children, Pharmacology and Therapeutics, Medical Jurisprudence, Practical and General Pathology, Bacteriology and Hygiene ; and also clinical examinations in Medicine, Surgery, Obstetrics, Gynæcology and Ophthalmology conducted at the bedside in the hospital :—

Ames, C. A.. .. .. Field, B.C.
Anthony, T. B.. .. .. Derwick, N.S.
Baillie, S. A., B.A.. .. .. Troy, N.Y.
Blair, H. G. F.. .. .. Ashton, Ont.
Brennan, F. A.. .. .. St. Albans, Vt., U.S.A.
Byers, J. R.. .. .. Gananoque, Ont.
Campbell, A.. .. .. Souris W., P.E.I.
Campbell, J. A. E., B.A.. .. .. Westmount, Que.
Cantlie, F. P. L.. .. .. Montreal, Que.
Carter, W. McL., B.A.. .. .. Quebec City, Que.
Christie, F. J.. .. .. Martintown, Ont.
Codrington, R. F.. .. .. Montreal, Que.
Colby, J. C., B.A.. .. .. Stanstead, Que.
Coleman, C. E.. .. .. Chatham, N.B.
Cox, R. B.. .. .. Collinsville, Conn., U.S.A.
Crozier, J. A.. .. .. Ashburn, Ont.
Cullen, W. H.. .. .. Montreal, Que.
Curren, L. M.. .. .. Springfield, N.B.
Currie, W. D., B.A... .. .. Halifax, N.S.
Dixon, J. D., B.A.. .. .. Montreal, Que.
Dixon, W. E., B.A.. .. .. Montreal, Que.
Dorion, W. A.. .. .. Montreal, Que.
Eastman, E. B.. .. .. Portsmouth, N.H., U.S.A.
Evans, S.. .. .. Ottawa, Ont.
Featherston, H. C.. .. .. Hamilton, Ont.
Folkins, H. G.. .. .. Millstream, N. B.

Forster, J. F. C. .. .. Dorchester, N.B.
Gardiner, R. J. .. .. Smith's Falls, Ont.
Gardner, W. A., B.A. .. .. Huntingdon, Que.
Green, F. W. .. .. Pictou, N.S.
Halliday, J. LeR. .. .. Sawyerville, Que.
Harris, L. C... .. .. Moncton, N.B.
Hart, F. W., B.A. .. .. Sackville, N.B.
Harvie, S. K., B.A. .. .. Newport, N.S.
Henry, C. M. .. .. Palmer, S.D., U.S.A.
Hollingsworth, J. E.. .. .. Ottawa, Ont.
Hopkins, C. W.. .. .. Aroostook Junction, N.B.
Hyatt E. A., B.Sc.. .. .. Dickinson Centre, N.Y., U.S.A.
Irwin, F.. .. .. Shelbourne, N. S.
Johnson, J. A., B.A.. .. .. Lachine, Que.
Johnson, G. R., B.A.. .. .. Annapolis, N.S.
Jones, N. C., B.A.. .. .. Gananoque, Ont.
Leney, J. M., B.A.. .. .. Montreal, Que.
Lidstone, A. E.. .. .. Aylmer, Que.
Lomas, A. J.. .. .. Montreal, Que.
MacCarthy, F. H.. .. .. Ottawa, Ont.
Macdonald, A. A., B.A.. .. .. St. Andrews, P.E.I.
MacKinnon, G. E. L.. .. .. Alexandria, Ont.
Maclaren, A. H., B.A.. .. .. Huntingdon, Que.
MacNaughton, J. A... .. .. Salisbury, N.B.
McGibbon, D.. .. .. Arkona, Ont.
McGibbon, S.. .. .. Arkona, Ont.
McGrath, R. H.. .. .. Dorchester, N.B.
McKee, W. E.. .. .. Coaticooke, Que.
McKenzie, J. B., B.A.. .. .. Campbellton, N.B.
McNeill, J. F.. .. .. Kensington, P.E.I.
Manchester, J. W.. .. .. St. John, N.B.
Martin, H. E.. .. .. Chatham, Ont.
Mason, E. G.. .. .. Westmount, Que.
Mason, F. C.. .. .. Plattsburg, N.Y.
Mason, J. LeD., B.A.. .. .. Montreal, Que.
May, L. W.. .. .. Ottawa, Ont.
Menzies, J. E.. .. .. New Bedford, Mass., U.S.A.
Moffatt, Geo.. .. .. Inkerman, Ont.
Morrison, J. F.. .. .. Copleston, Ont.
Morse, W. R., B.A.. .. .. Laurencetown, N.S.
Mothersill, G. S.. .. .. Ottawa, Ont.
Palmer, G. H... .. .. Dorchester, N.B.
Paterson, R. C., B.A.. .. .. Montreal, Que.

Peters, O. R.. .. .. Gagetown, N.B.
Pickard, L. N.. .. .. Charlottetown, P.E.I.
Pratt, C. M.. .. .. St. John, N.B.
Ritchie, C. F. P., B.A.. .. .. Montreal, Que.
Roberts, A. B.. .. .. Lanark, Ont.
Ship, M. L., B.A.. .. .. Montreal, Que.
Smith, T. W.. .. .. Hawkesbury, Ont.
Stockwell, H. K.. .. .. Danville, Que.
Tolmie, J. A.. .. .. Moose Creek, Ont.
Tracy, E. A., B.A.. .. .. Lancaster, N.H., U.S.A.
VanWart, R. McL., B.A.. .. .. Fredericton, N.B.
Walker, H., Jr., B.A. .. .. New York, N.Y., U.S.A.
Williams, R. G.. .. .. Meaford, Ont.

THIRD YEAR.

PRIZE LIST.

THIRD YEAR PRIZEMAN,

F. S. PATCH, B.A., of Montreal, Que.

SUTHERLAND MEDALLIST,

E. M. MCLAUGHLIN, of Winona, Minn., U.S.A.

HONORS IN AGGREGATE OF ALL SUBJECTS.

1. Patch, F. S. B.A.
2. McLaughlin, E. M.
3. McCulloch, J. M.
4. Parris, N. D.
5. Cowperthwaite, H. H.
6. Burns, A. S., B.A.
7. English, J. M.
8. King, Robt., B.A.
9. Nelson, W. E.
10. Elder, Robt., B.A.
11. Ells, R. H., B.A.
12. Anderson, C. W., B.A.
13. Turner, G. H., B.A.
14. McLaren, D. D.

HONOURS IN CLINICAL CHEMISTRY.

1. Fortin, C. E. F., B.A.
   Nelson, W. E.
   Parris, N. D.
4. Crosby, P. C.
   Cumming, W. G., B.A.
6. English, J. M.
   Frost, A. C.
   Kenny, R. W.
   Morris, S. C.
10. Langsford, A. W.
    Lynch, A. L.
    Townsley, R. H.
13. Anderson, C. W., B.A.
14. Donnelly, W. H.
15. Gale, W. P.
    Gow, R. J.
    Lamb, W. V.
    McCulloch, J. M.
    Magee, C. F.
    Patch, F. S., B.A.
    Strong, N., B.A.
22. Campbell, W. G.
23. Dickson, A. J., B.A.
    Elder, R., B.A.
    Maby, W. J.
26. Chaplin, H. L. S.
    Ebbett, P. L. B.
28. Auston, J. B.
    Bishop, G. A.
    Taggart, E. A.
    Truax, W.

HONOURS IN MENTAL DISEASES.

1. Secord, H. W.
2. Burns, A. S., B.A.
3. Mitchell, I. E.
4. Townsley, R. H.
5. McLaughlin, E. M.
   Patch, F. S., B.A.
   Church, H. C.
8. McKechnie, D. W.
9. Nelson, J. S.
   Maby, W. J.
   Elder, Robt., B.A.
12. Allan, Robt.
13. Nelson, W. E.
14. Magee, C. F.
    Miller, V. L., B.A.
16. Laurie, E., B.A.
17. English, J. M.
18. McEwen, J. R., B.A.
    McIntosh, J. A.
20. Gilmour, C. R.
21. Smith, C. M.
    Cowperthwaite, H. H.
23. Blakeman, F. W.
    Rehfuss, W. N., B.A.
25. Lundie, J. A., B.A.
    McDonald, R. St. J., B.A.
    Thomas, S. B.

HONOURS IN HYGIENE.

1. Ells, R. H., B.A.
2. Bishop, L. C.
3. Cowperthwaite, H. H.
   Parris, N. D.
5. McLaren, D. D.
6. Laurie, E., B.A.
7. Burns, A. S., B.A.
8. Patch, F. S., B.A.
9. McPherson, T., B.A.
   Shaw, D. LeB.
11. Church, H. C.

HONOURS IN GENERAL PATHOLOGY.

1. Patch, F. S., B.A.
2. Burns, A. S., B.A.
3. McLaughlin, E. M.
4. King, Robt., B.A.
5. Turner, G. H., B.A.
6. McCulloch, J. M.
7. Bishop, L. C.
   Cowperthwaite, H. H.
   Macdonald, R. St. J., B.A.
   Parris, N. D.
11. Douglas, F. C.
    English, J. M.
13. Thomas, S. B.
14. Elder, Robt., B.A.
    Magee, C. F.
    Rehfuss, W. N., B.A.
    Strong, N., B.A.
18. Anderson, C. W., B.A.

HONOURS IN OBSTETRICS.

1 Horsfall, F. L., B.A.
King, Robt., B.A.
Macdonald, R. St. J., B.A.
4. Campbell, W. G.
Cowperthwaite, H. H.
Turner, G. H., B.A.
7. Burns, A. S., B.A.
Douglas, F. C.
Patch, F. S., B.A.
10. Lamb, W. V.
Langsford, A. W.
Lundie, J. A., B.A.
Lynch, A. L.
14. McLaughlin, E. M.
Mitchell, I. E., B.A.
Robertson, W. G.
17. Cumming, W. G., B.A.
MacKenzie, W. A.
Maby, W. J.
Secord, H. W.
Strong, N., B.A.
22. Freeze, E. H.
McCulloch, J. W.
McDiarmid, C. A.
25. Ebbett, P. L. B.
Markson, S.
27. Auston, J. B.
Bishop, L. C.
McGrath, F. C.
Montgomery, C. H.
Parris, N. D.
Rehfuss, W. N., B.A.
33. Anderson, C. W., B.A.
McEwan, J. R., B.A.
Meindl, A. G.
Shaw, D. LeB.
Townsley, R. H.
White, S. G.

HONOURS IN CLINICAL SURGERY.

1. McLaughlin, E. M.
2. Anderson, C. W., B.A.
Brooks, J. E., B.A.
Church, H. C.
Cowperthwaite, H. H.
Donnelly, W. H.
MacKenzie, W. A.
Murray, J. S.
9. Chamberlain, H. B.
Langsford, A. W.
McCulloch, J. M.
12 Allum, A. W.
Bishop, L. C.
Campbell, W. G.
Ebbett, P. L. B.
English, J. M.
McDiarmid, C. A.
Parris, N. D.
Thomas, S. B.
Townsley, R. H.

HONOURS IN PHARMACOLOGY AND THERAPEUTICS.

1. Willmore, J. G.
2. Sellery, A. C.
3. McLaughlin, E. M.
4. McCulloch, J. M.
5. Burns, A. S.
   Patch, F. S., B.A.
7. Parris, N. D.
8. Bishop, L. C.
9. Ebbett, P. L. B.
   McEwan, J. R., B.A.
11. Forbes, R. D.
12. Horsfall, F. L., B.A.
13. Church, H. C.
14. Strong, N., B.A.
15. Nelson, W. E.
16. Cowperthwaite, H. H.
17. English, J. M.
    McIntosh, J. A.
    Taggart, E. A.
20. Elder, R., B.A.
    Fortin, C. E. F., B.A.
    Thomas, S. B.
    Turner, G. H., B.A.

HONOURS IN BACTERIOLOGY.

1. Willmore, J. G.
2. King, R., B.A.
3. Nelson, W. E.
4. Parris, N. D.
5. Ells, R. H., B.A.
   McLaughlin, E. M.
7. Turner, G. H., B.A.
8. Douglas, F. C.
   Patch, F. S
   Rehfuss, W. N., B.A.
11. English, J. M.
12. Laurie, E., B.A.
13. Cowperthwaite, H. H.
14. McCulloch, J. M.
    McEwan, J. R., B.A.
16. Horsfall, F. L., B.A.
    Montgomery, C. H.
    McEachran, I. W. T.

HONOURS IN CLINICAL MEDICINE.

1. Parris, N. D.
2. Patch, F. S., B.A.
3. Lynch, A. L.
   McLaughlin, E. M.
5. Ebbett, P. L. B.
6. Anderson, C. W., B.A.
   Burns, A. S., B.A.
   Cowperthwaite, H. H.
   Ells, R. H., B.A.
   Kissane, J. W.
   Lyman, W. S., Ph.B.
   Rehfuss, W. N., B.A.
   Townsley, R. H.
14. Langsford, A. W.
15. English, J. M.
16. Munroe, H. E.
    Murray, J. S.
    Thomas, S. B.
19. McKechnie, D. W.
20. McCulloch, J. M.
21. Allan, Robt.
    Boulter, J. H.
    Chandler, E. C.
    Gale, W. P.
    Lamb, W. V.
    Maby, W. J.
    Strong, N., B.A.
    Turner, G. H., B.A.
29. McEwen, J. R., B.A.

HONOURS IN MEDICAL JURISPRUDENCE.

1. McCulloch, J. M.
2. McLaren, D. D.
3. Church, H. C.
   Turner, G. H., B.A.
5. McLaughlin, E. M.
6. Elder, Robt., B.A.
7. Cowperthwaite, H. H.
8. Burns, A. S., B.A.
   Magee, C. F.,
   Morris, L. C.
   Rehfuss, W. N., B.A.
   Shaw, D. LeB.
   Wilson, A.
14. McEwan, J. R., B.A.
    Patch, F. S., B.A.
16. Brooks, J. E., B.A.
    Thomas, S. B.
18. Anderson, C. W., B.A.
    Boyd, R. M.
    Langsford, A. W.
    Lynch, A. L.
    Montgomery, C. H.
    Munroe, H. B., B.A.
    O'Neill, J. M.

THIRD YEAR. PASS LIST.

All Subjects.

The following students, 94 in number, have passed in all the subjects of the Third Year, viz.: Pathology, Pharmacology and Therapeutics, Hygiene and Bacteriology, Medical Jurisprudence, Mental Diseases, Medicine, Surgery, Clinical Chemistry and Obstetrics.

Allan, Robt.
Anderson, C. W., B.A.
Andrews, J. J.
Auston, J. B.
Bishop, G. A.
Bishop, L. C.
Blair, H. G. F.
Boyd, R. M.
Burns, A. S., B.A.
Campbell, W. G.
Cantlie, F. P. L.
Carter, W. LeM.
Codrington, R. F.
Coleman, C. E.
Cowperthwaite, H. H.
Croft, L. V.
Currie, W. D.
Dickson, A. J., B.A.
Donnelly, W. H.
Douglas, F. C.
Doyle, F. H.
Ebbett, P. L. B.
Elder, Robt., B.A.
Ells, R. H., B.A.
English, J. M.
Fisher, F., B.A.
Forbes, R. D.
Fortin, C. E. F., B.A.
Freeze, E. H.
Frost, A. C.
Gale, W. P.
Gardner, R. J.
Hansen, N. C., M.A.
Hardisty, H. R. M., B.A.
Henry, C. M.
Horsfall, F. L., B.A.
Hynes, W. T.
Irwin, F.
King, R., B.A.
Kissane, J. W.
Lamb, W. V.
Langsford, A. W.

Laurie, E., B.A.
Lidstone, A. E.
Lundie, J. A., B.A.
Lyman, W. S., Ph.B.
Lynch, A. L.
MacKinnon, G. E. L.
MacKinnon, I. W.
McCulloch, J. M.
McEwan, J. R., B.A.
McGrath, F. C., B.A.
McGrath, R. H.
McIntosh, H. H.
McIntosh, J. A.
McKechnie, D. W.
McLaren, D. D.
McLaughlin, E. M.
McPherson, T., B.A.
Maby, W. J.
Magee, C. F.
Martin, H. E.
Mason, F. C.
Meindl, A. G.
Mitchell, I. E., B.A.
Montgomery, C. H.
Morris, S. C.
Munroe, H. B., B.A.
Munroe, H. E.
Nelson, W. E.
O'Brien, C. W.
O'Neill, J. M.
Palmer, G. H.
Parris, N. D.
Patch, F. S., B.A.
Peterson, G. R.
Puddington, B. A.
Rehfuss, W. N., B.A.
Robertson, W. C.
Saunders, W. E.
Secord, H. W.
Shaw, D. LeB.
Slack, M. R.
Strong, N., B.A.
Symmes, C. R.
Taggart, E. A.
Tanner, C. A. H.
Thomas, S. B.
Tolmie, J. A.
Townsley, R. H.
Tracy, E. A., B.A.
Truax, W.
Turner, G. H., B.A.
White, S. G.

In addition to those whose names appear on the above list, as having passed in all the subjects of the Third Year, the following have passed in :—

PHARMACOLOGY.

Allum, A. W.
Boulter, J. H., B.A.
Boyd, O.
Brooks, J. E., B.A.
Chaplin, H. L. S.
Church, H. C.
Cullen, W. H.
Cumming, W. G., B.A.
Dickson, W. H.
Faulkner, J. A.
Fisher, F.
Gilmour, C. R.
Gow, R. J.
Kenny, R. W.
Kerr, H. H.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McEachran, I. W. T.
Munro, J. H.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Sellery, A. C.
Steeves, E. O.
Stowell, F. E.
Willmore, J. G.
Wilson, A.

PATHOLOGY.

Bailey, G. W.
Boulter, J. H., B.A.
Boyd, O.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Cullen, W. H.
Cumming, W. G., B.A.
Dickson, W. H.
Gow, R. J.
Hutchinson, J. W.
Kenny, R. W.
Macdonald, R. St. J., B.A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Munro. J. H.
Murray, J. S.
Park, A. W.
Steeves, E. O.
Stowell, F. E.
Wilson, A.

HYGIENE.

Allum, A. W.
Bailey, C. W.
Blakeman, F. W.
Boire, W. E.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Cumming, W. G., B.A.
Dickson, W. H.
Ford, W. S.
Gilmour, C. R.
Gow, R. J.
Hutchinson, J. W.
Igoe, O. A.
Kenny, R. W.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Munro, J. H.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Scott, W.
Smith, C. M.
Steeves, E. O.
Stowell, F. E.
Wilson, A.

MEDICAL JURISPRUDENCE.

Allum, A. W.
Bailey, G. W.
Blakeman, F. W.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Crosby, P. C.
Cumming, W. G., B.A.
Dickson, W. H.
Dowson, C. K.
Gillis, J. H.
Gilmour, C. R.
Hutchinson, J. W.
Kenny, R. W.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Munro, J. H.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Shillington, R. N. W.
Smith, C. M.
Steeves, E. O.
Stowell, F. E.
Wilson, A.

MENTAL DISEASES.

Allum, A. W.
Bailey, G. W.
Blakeman, F. W.
Boire, W. E.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Brooks, J. E., B.A.
Bromley, J. E.
Chamberlain, H B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Cumming, W. G., B.A.
Dickson, W. H.
Gilmour, C. R.
Gow, R. J.
Harrison, L. L.
Kenny, R. W.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Markson, S.
Miller, V. L., B.A.
Munro, J. H.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Scott, W.
Seifert, F. W., B.A.
Shillington, R. N. W.
Smith, C. M.
Steeves, E. O.
Wilson, A.

CLINICAL MEDICINE.

Allum, A. W.
Bailey, G. W.
Blakeman, F. W.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Carnochan, W. L. C.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Dowson, C. K.
Gillis, J. H.
Gilmour, C. R.
Gow, R. J.
Kenny, R. W.
MacKenzie, W. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Scott, W.
Smith, C. M.
Stowell, F. E.
Thomas, J. W.
Wilson, A.

CLINICAL SURGERY.

Allum, A. W.
Bailey, G. W.
Blakeman, F. W.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Cumming, W. G., B.A.
Dickson, W. H.
Donovan, J. B.
Dowson, C. K.
Gillis, J. H.
Gilmour, C. R.
Gow, R. J.
Kenny, R. W.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McGuigan, J. D.
Munro, J. H.
Murray, J. S.
Nelson, J. S.
Park, A W.
Scott, W.
Smith, C. M.
Stowell, F. E.
Thomas, J. W.
Wilson, A.

CLINICAL CHEMISTRY.

Allum, A. W.
Bailey, G W.
Blakeman, F. W.
Boire, W. E.
Boulter, J. H., B.A.
Boyd, O.
Briggs, J. A.
Brooks, J. E., B.A.
Bromley, J. E.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Covernton, C. F.
Crosby, P. C.
Cumming, W. G., B.A.
Dickson, W. H
Ford, W. S.
Gillis, J. H.
Gilmour, C. R.
Gow, R. J.
Hutchinson, J. W.
Inksetter, F. S.
Kenny, R. W.
Kerr, H. H.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Seifert, F. W., B.A.
Shillington, R. N. W.
Smith, C. M.
Steeves, E. O.
Stowell, F. E.
Willmore, J. G.
Wilson, A.

OBSTETRICS.

Allum, A. W.
Anton, D. L. S.
Bailey, G. W.
Blakeman, F. W.
Boire, W. E.
Boulter, J. H., B.A.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Chaplin, H. L. S.
Church, H. C.
Cumming, W. G., B.A.
Dickson, W. H.
Dowson, C. K.
Ford, W. S.
Gillis, J. H.
Gilmour, C. R.
Hutchinson, J. W.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Markson, S.
Munro, J. H.
Nelson, J. S.
Scott, W.
Shillington, R. N. W.
Smith, C. M.
Steeves, E. O.
Stowell, F. E.

BACTERIOLOGY.

Allum, A. W.
Blakeman, F. W.
Boyd, O.
Brooks, J. E., B.A.
Chandler, E. C.
Church, H. C.
Crosby, P. C.
Cumming, W. G., B.A.
Dickson, W. H.
Gilmour, C. R.
Gow, R. J.
Hutchinson, J. W.
Kenny, R. W.
Kerr, H. H.
Macdonald, R. St. J., B.A.
MacKenzie, W. A.
McDiarmid, C. A.
McDonald, S. H., B.A.
McEachran, I. W. T.
McGuigan, J. D.
Murray, J. S.
Nelson, J. S.
Park, A. W.
Scott, W.
Smith, C. M.
Steeves, E. O.
Willmore, J. G.
Wilson, A.

SECOND YEAR.

PRIZES AND HONOURS.

SECOND YEAR PRIZEMAN,
J. A. NUTTER, B.A., of Montreal, Que.

SENIOR ANATOMY PRIZE.
J. L. ROBINSON, St. Mary's, Ont.

HONOURS IN AGGREGATE OF ALL SUBJECTS:

1. Nutter, J. A., B.A.
2. Miller, V. L., B.A.
3. Robinson, J. L.
4. Dillon, W. P.
   Willmore, J. G.
6. Wood, W. H.
7. Chipman, W. W.
8. Coffin, J. W.
9. Lincoln, W. A.
10. McKenty, F.
11. Lippiatt, H. T.
12. Sellery, A. C.
13. Fyshe, J. C., A.B.

PHYSIOLOGY—HONOURS.

1. Nutter, J. A., B.A.
2. Miller, V. L., B.A.
3. Wood, W. H.
4. Robinson, J. L.
5. Cook, W. J.
6. Dillon, W. P.
7. Ainley, W. E., B.A.
8. Yorston, F. P.
9. McIntosh, L. de C.
10. Sellery, A. C.
11. Chipman, W. W.
    Lincoln, W. A.

PRACTICAL CHEMISTRY.

HONOURS.

1. Blanchet, S. F. N.
   McKenty, F.
   Robinson, J. L.
4. Geddes, R. W., B.A.
5. Alford, J. H.
   Judson, A. H.
   Likely, D. S.
   McLachlan, D. C.
   Meakins, J. C.
10. Coffin, J. W.
    Johnson, J. G. W., B.A.
    Preston, C. E.
13. Douglas, E., B.A.
    Nelles, T. R. B.
    Nutter, J. A., B.A.
    Stewart, J. A.
17. Charman, F. D.
    Gibson, G. M.
    Gillis, J. E.
    Gilroy, J. R.
21. Chipman, W. W.
    Howitt, H. O.
    Lincoln, W. A.
    McIntosh, L. de C.
    Wright, G. A.

HISTOLOGY—HONOURS.

1. Faulkner, J. A., B.A.
   Robinson, J. L.
3. Dillon, W. P.
   Fyshe, J. C., A.B.
   Lauchland, L. C., B.A.
   Miller, V. L., B.A.
   Nutter, J. A., B.A.
8. Charman, F. D.
   Douglas, E., B.A.
   Gillis, J. E.
   Sellery, A. C.
   Yorston, F. P.
13. Ainley, W. E., B.A.
    Crowell, B. C., B.A.
    Gibson, R.
    Hunter, J. D.
    Lippiatt, H. T.
    McIntosh, L. deC.
    McLachlan, D. C.
    Rogers, J. T., B.A.
    Winder, J. B., B.A.
    Wood, W. H.

PHARMACOLOGY—HONOURS.

1. Miller, V. L., B.A.
   Nutter, J.A., B.A.
   Sellery, A. C.
4. Rankin, A. C.
5. Fyshe, J. C., A.B.
6. Chipman, W. W.
7. Atkinson, H. S.
8. Lippiatt, H. T.
9. Ainley, W. E., B.A.
   Charman, F. D.
11. Gillis, J. E.
    McIntosh, L. deC.
    Richardson, C. A. C., B.A.
14. Coffin, J. W.
    Dillon, W. P.
    Robinson, J. L.
17. Alford, J. H.
    Blanchet, S. F. N.
    Lincoln, W. A.
    McKenty, F.
    McKenzie, R. P.
    Stewart, J. A.
    Wood, W. H.

CHEMISTRY—HONOURS.

1. Nutter, J. A., B.A.
2. Robinson, J. L.
3. Wood, W. H.
4. Dillon, W. P.
   Lippiatt, H. T.
6. Chipman, W. W.
7. Atkinson, H. S.
8. Stewart, J. A.
9. Nelles, T. R. B.
10. Lincoln, W. A.
11. McKenty, F.
12. Dunn, J. F.
13. Coffin, J. W.
14. Greenwood, W. T.
15. McKenzie, R. P.
16. Charman, F. D.
    Richardson, C. A.
18. Cook, W. J.
19. Fyshe, J. C., A.B.
20. Rankin, A. C.
21. Johnson, J. G. W., B.A.
    McIntosh, L. deC.
    Martin, J. C.

ANATOMY—HONOURS.

1. Miller, V. L., B.A.
2. Nutter, J. A., B.A.
3. Harrison, L. L., B.A.
4. Robinson, J. L.
5. Willmore, J. G.
6. Dillon, W. P.
7. Coffin, W. J.
   Gillis, J. E.
9. Fyshe, J. C.
10. Kerr, H. H.
11. Howitt, H. O.
12. Rankin, A. C.
13. Lauchland, L. C., B.A.
14. Lincoln, W. A.
    Lippiatt, H. T.

SECOND YEAR. PASS LIST.

All Subjects.

The following gentlemen, 105 in number, have completed their Second Year Examinations, which comprise the following subjects :— Anatomy, Practical Anatomy, Chemistry, Practical Chemistry, Physiology, Practical Physiology, Histology and Materia Medica.

Ainley, L. T., B.A.
Ainley, W. E., B.A.
Allan, R. H.
Allum, A. W.
Atkinson, H. S.
Bailey, G. W.
Bentley, J. S., B.A.
Bishop, G. A.
Black, J. C.
Blakeman, F. W.
Blanchet, S. F. N.
Boire, W. E.
Bonin, R. P.
Boulter, J. H.
Boyd, R. M.
Brooks, J. E., B.A.
Chamberlain, H. B.
Chandler, E. C.
Charman, F. D.
Chipman, W. W.
Coffin, J. W.
Cook, W. J.
Crack, I. E.
Croft, L. V.
Crowell, B. C., B.A.
Currie, W. D.
Dickson, W. H.
Dillon, W. P.
Dorion, W. A.
Douglas, E., B.A.
Doyle, F. H.
Dunn, J. F.
Eaton, C. E.
Faulkner, J. A., B.A.
Fisher, E. M.
Fisher, F.
Ford, H. S.
Fraser, S.
Freeze, E. H.
Frost, A. C.
Fyshe, J. C., A.B.
Geddes, R. W., B.A.
Gillis, J. E.
Gilmour, C. R.
Gormely, J. C.
Gow, R. J.
Grant, N. P.
Greenwood, W. T.

Hotchkiss, E. A.
Howitt, H. O.
Hutchinson, J. W.
Johnson, J. G. W., B.A.
Kerr, H. H.
Keys, M. J.
Lamb, W. V.
Lauchland, L. C., B.A.
Lincoln, W. A.
Lippiatt, H. T.
Losier, A. J.
Lyman, W. S.
MacKenzie, A. B.
MacKenzie, W. A.
McDiarmid, C. A.
McGibbon, D.
McGrath, R. H.
McGuigan, J. D.
McIntosh, L. de C.
McKenty, F.
McKenzie, R. P.
McLachlan, D. C.
Martin, J. C.
Meakins, J. C.
Miller, C.
Miller, V. L., B.A.
Munro, J. H.
Munroe, H. B., B.A.
Munroe, H. E.
Murphy, H. H.
Nelson, J. S.
Ness, W.
Nutter, J. A., B.A.
Preston, C. E.
Puddington, B. A.
Quain, B. P.
Rankin, A. C.
Reford, L. L., B.A.
Richardson, C. A.
Robertson, W. G.
Robinson, J. L.
Rogers, J. T., B.A.
Scott, W.
Sellery, A. C.
Shillington, R. N. W.
Smith, C. M.
Slack, M. R.
Stewart, J. A.
Stockwell, H. K.
Stowell, F. E.
Truax, W.
Wilson, A.
Wilson, C. E.
Willmore, F. G.
Wood, W. H.
Wright, G. A.
Yorston, F. P.

In addition to those whose names appear on the above list, having passed in all subjects of the Second Year, the following have passed in :—

PHARMACOLOGY.

Alford, J. M.
Crosby, P. C.
Dalton, J. T.
Ernandez, J. A.
Gibson, R.
Gill, F. D.
Gillis, J. R.
Gilroy, J. R.
Inksetter, F. S.
Lawson, G. E.
Mackid, L. S.
McDonald, J. C.
McLeod, W. A.
Markson. S. M.
Nagle, S. M.
Richardson, C.AC.,B.A.
Seifert, F. W.
Sims, H. A.
Smith, W. A., B.A.
Sweeney, J. L., B.A.
Warwick, W.
Waterman, C.
Wigle, C. A.
Wilson. T. R., B.A.
Wood, H. G.

HISTOLOGY.

Alford, J. M.
Cunningham, F. J.
Dalton, J. T.
Davidson, H. J. D.
Ernandez. J. A.
Folkins, C. G.
Gibson, G. M.
Gibson, R.
Graham, R. W.
Harrison, L. L., B.A.
Hogan, F. J.
Hughton, M.
Hunter, J. D.
Judson, A. H.
Lacasse, L. J.
Lawson, G. E.
McDonald, J. C.
Margolese, O.
Markson, S. M.
Nagle, S. M.
Price, J.
Richardson, C.A.C.,B.A
Rilance, C. D.
Sims, H. A.
Smith, W. A., B.A.
Styles, W. H.
Warwick, W.
Waterman, C.
Wigle, C. A.
Wilson, O. M.
Wilson, T. R., B.A.
Winder, J. B., B.A.
Winfrey, W. C., B.L.
Wood, H. G.

ANATOMY.

Anton, D. L. S.
Arnold, D. R.
Carnochan, W. L. C.
Davidson, H. J. D.
Ferguson, W. H.
Gibson, G. M.
Gibson, R.
Gillis, J. R.
Gilfroy, J. R.
Graham, R. W.
Harrison, L. L., B.A.
Hogan, F. J.
Judson, A. H.
Lawson, G. E.
Lundie, J. A.
Mackid, L. S.
MacKinnon, I. W.
McLeod, W. A.
Nagle, S. M.
Nathan, D.
Pavey, C. A.
Price, J.
Richardson, C.A.C.,B.A
Warwick, W.
Wilson, O. M.
Wilson, T. R., B.A.
Winder. J. B., B.A.
Winfrey, W. C., B.L.
Wood, H. G.

PHYSIOLOGY.

Alford, J. H.
Crosby, P. C.
Folkins, C. G.
Fortin, C.E.F., B.A.
Gibson, G. M.
Gibson, R.
Graham, R. W.
Hogan, F. J.
Judson, A. H.
Lawson, G. E.
Markson, S. M.
Nagle, S. M.
Price, J.
Richardson, C.A.C.,B.A
Rilance, C. D.
Sims, H. A.
Smith, W. A., B.A.
Warwick, W.
Waterman, C.
Wigle, C. A.
Wilson, O. M.
Wilson, T. R., B.A
Winder, J. B., B.A.
Winfrey, W. C., B.L.

CHEMISTRY.

Alford, J. H.
Arnold, D. R.
Chisholm, H. A.
Crosby, P. C.
Ernandez, J. A.
Folkins, C. G.
Gibson, G. M.
Gibson, R.
Gill, F. D.
Graham, R. W.
Gourley, H. B.
Hogan, F. J.
Hynes, W. T.
Inksetter, F. S.
Judson, A. H.
Mackid, L. S.
MacKinnon, I. W.
Margolese, O.
Nelles, T. R. B.
Price, J.
Richardson, C.A.C.,B.A
Rilance, C. D.
Sims, H. A.
Smith, W. A., B.A.
Styles, W. H.
Sawyer, A. R.
Wigle, C. A.
Wilson, O. M.
Wilson, T. R., B.A.
Winder, J. B., B.A.
Winfrey, W. C., B.L.
Wood, H. G.

PRACTICAL CHEMISTRY.

Alford, J. H.
Bonelli, V.
Chisholm, H. A.
Dalton, J. T.
Ernandez, J. A.
Gibson, G. M.
Gill, F. D.
Gilroy, J. R.
Graham, R. W.
Gourley, H. B.
Henry, E. G.
Hogan, F. J.
Judson, A. H.
Lacasse, L. J.
Lawson, G. E.
Likely, D. S.
Mackid, L. S.
Nelles, T. R. B.
Price, J.
Rilance. C. D.
Sims, H. A.
Styles, W. H.
Sawyer. A. R.
Wilson, O. M.
Warwick, W.
Winfrey, W. C., B.L.
Wotherspoon, H.
Young, G. J.

FIRST YEAR.

PRIZES AND HONOURS.

FIRST YEAR PRIZEMAN,

F. J. TEES, B.A., of Montreal, Que.

JUNIOR ANATOMY PRIZE,

J. A. C. TULL, of Antigua, B.W.I.

HONOURS IN AGGREGATE OF ALL SUBJECTS.

1. Tees, F. J., B.A.
2. Henderson, E. H., B.A.
3. Mersereau, H. C.
4. Scrimger, F. A. C., B.A.
5. Likely, D. S., B.A.
6. Cumming, A., B.A.
7. Leslie, H. A.
8. Dykes, W.
9. MacDermot, J. H.

HONOURS IN CHEMISTRY.

1. Henderson, E. H., B.A.
   Ryan, F. McD., B.A.
3. Leslie, H. A.
   Mersereau, H. C.
   Scrimger, F. A. C., B. A.
6. Scott, W. J., B.A.
7. MacDermot, J. H.
8. Dougan, B. H.
   Dykes, W.
   Tees, F. J., B. A.
11. Burgess, H. C.
    Likely, D. S., B.A.
    Rommel, E.
14. Brown, F. F.
    Prendergast, A. R., B.A.
16. Alguire, A. R.
    Hume, G. M.
    King, J. L.
    Valin, R. E.
20. Brown, G. T.
21. Moffatt, C. F., B.A.
    Turnbull, E. G.
23. Wilkinson, W. M.
24. Hanington, D. P.
25. Muckleston, H. S., M.A.
    Richards, E. T. F.
27. Auld, J. W.
    Sinclair, E. E.
    Tierney, J. E.

HONOURS IN BACTERIOLOGY.

1. Henderson, E. H., B.A.
2. Scrimger, F. A. C., B.A.
   Tees, F. J., B.A.
4. Dykes, W.
5. Likely, D.S., B.A.
6. Scott, W. J., B.A.
7. Cumming, A., B.A.
8. Moffatt, C. F., B.A.
   Tull, J. A. C.

HONOURS IN ELEMENTARY BIOLOGY.

1. Tees, F. J., B.A.
2. Scrimger, F. A. C., B.A.
3. Henderson, E. H., B.A.
4. McMurtry, S. O., B.A.
6. Cumming, A., B.A.
   Likely, D. S., B.A.
8. Leslie, H. A.
9. Mersereau, H. C.
10. MacDermot, J. H.
11. Soady, J. H., B.A.
    Tull, J. A. C.

HONOURS IN PHYSIOLOGY.

1. Mersereau, H C.
2. Scrimger, F. A. C., B.A.
3. Nelles, T. R. B.
4. McMurtry, S. O., B.A.
5. Cumming, A., B.A.
   MacDermot, J. H.
7. Hanington, D. P.
8. Burgess, H. C.
   Leslie, H. A.
   Ryan, F. McD., B.A.
   Tees, F. J., B.A.

HONOURS IN HISTOLOGY.

1. Tees, F. J.
2. MacLean, J. D.
   Robertson, B. W.
4. Dougan, G. H.
   Moffatt, C. F., B.A.
   Soady, J. H., B.A.
7. Henderson, E. H., B.A.
   Mohr, F. W. C.
   Wood, G. O.
10. Ewart, D.
    Richards, E. T. F.
12. Cumming, A., B.A.
    Dykes, W.
    Hanington, J. W. B.
    Hume, G. M.
    Leslie, H. A.
    McNaughton, W. B.
    Mercer, T. C.
    Mercereau, H. C.
    Prendergast, A. R., B.A.
    Sinclair, E. E.
22. Brown, F. F.
    Likely, D. S., B.A.
24. Brown, G. T.
    Duggan, R. G.
    MacDermot, J. H.
    Robertson, A. R.
    Scrimger, F. A. C., B.A.
    Tull, J. A. C.
    Turnbull, E. G.
    Valin, R. E.

ANATOMY—HONOURS.

1. Mohr, F. W. C.
2. Mersereau, H. C.
3. Tull, J. A. C.
4. McNaughton, W. B.
   Scrimger, F. A. C., B.A.
   Burgess, H. C.
7. Likely, D. S., B.A.
8. Chisholm, H. A.
9. Brown, F. F.
8. Cumming, A., B.A.
   Mercer, F. C.
   Leslie, H. A.
   Muckleston, H. S., M.A.
   McDermot, J. H.
15. Henderson, E. H., B.A.
   Turnbull, E. G.
17. Dougan, B. M.
   Dykes, W.
   Sullivan, J. A.
   Richards, E. T. F.
21. Grimmer, R. D.
   Loggie, W. S.
   McDonald, J. A.
24. MacLean, J. D.
25. Wood, G. O.
26. McMurtry, S. O., B.A.
   Mason, J. H.
   Alguire, A. R.
   Tees, F. J., B.A.
   Costello, W. J., B.A.

PRACTICAL CHEMISTRY.

HONOURS.

1. Henderson, E. H., B.A.
   Mason, J. H.
3. Leslie, H. A.
   McMurtry, S. O., B.A.
5. Alguire, A. R.
   Likely, D. S., B.A.
   McIntosh, G. J.
8. Grimmer, R. D.
   Mersereau, H. C.
   Petersky, S.
   Sinclair, E. E.
12. Brown, F. F.
   Mohr, F. W. C.
   Robertson, B. W.
   Tees, F. J., B.A.
16. Loggie, W. S.
   McDougald, W. L.
   McNaughton, W. B.
   Wood, G. O.
20. Cumming, A., B.A.
   Richards, E. T. F.
   Valin, R. E.

FIRST YEAR. PASS LIST.

All Subjects.

The following students, 78 in number, have passed the examination in all the subjects of the First Year, viz. :—Anatomy, Chemistry and Physics, Physiology, Histology, Biology, Practical Chemistry and Bacteriology.

Alguire, A. R.
Brown, F. F.
Brown, G. T.
Burgess, H. C.
Chisholm, H. A., B.A.
Costello, W. J., B.A.
Covernton, C. F.
Cumming, A., B.A.

Dalton, J. T.
Davidson, H. D.
Deugan, B. H.
Dowler, W. H.
Dykes, W.
Ewart, D.
Finigan, J. F.
Folkins, C. G.
Hanington, D. P.
Hanington, J. W. B.
Heagerty, J. J.
Henderson, E. H., B.A.
Henry, E. G.
Houghton, M.
Hume, G. M.
Hunter, J. D.
Inksetter, F. S.
King, J. L.
Lacasse, L. J.
Leslie, H. A.
Likely, D. S., B.A.
Loggie, W. S.
MacCallum, J. D. C.
MacDermot, J. H.
MacDonald, J. P.
MacLean, J. D.
McDonald, J. C.
McDonald, J. A.
McLeod, W. A.
McMicking, A. E. T.
McMurtry, S. O., B.A.
McMurtry, W. C.
McNaughton, W. B.
Margo'ese, O.
Mason, J. H.
Mercer, T. C.
Mersereau, H. C.
Moffatt, C. F., B.A.
Mohr, F. W. C.
Muckleston, H. S., M.A.
Mulligan, J. W.
Nelles, T. R. B.
Petersky, S.
Prendergast, A. R., B.A.
Pruyn, W. G.
Richards, E. T. F.
Richardson, C. A. C., B.A.
Robertson, B. W.
Rommel, E.
Ryan, F. McD., B.A.
Scott, W.
Scrimger, F. A. C., B.A.
Shaw, D. LeB.
Sibbald, J. P. M.
Sinclair, E. E.
Soady, J. H., B.A.
Styles, W. A.
Sullivan, J. A.
Sweeney, J. L., B.A.
Tees, F. J., B.A.
Tull, J. A. C.
Turnbull, E. G.
Valin, R. E.
Viner, N., B.A.
Wilkinson, W. M.
Wood, G. O.
Wotherspoon, H. C.
Wright, G. A.
Young, C. A.
Young, G. J.

FIRST YEAR.

In addition to those whose names appear on the above list, as having passed in all subjects of the First Year, the following have passed in :—

HISTOLOGY.

Auld, J. W.
Bonelli, V., B.A.
Cameron, A. B.
Duggan, R. G.
Fripp, G. D.
Greene, H. B.
Grimmer, R. D.
Gunn, A. K.
Joughin, J. H.
King, S. S.
McIntosh, G. J.
Morrison, J. C.
Raftery, C. R.
Rilance, C. D.
Robertson, A. R.
Sawyer, A. R.
Somerville, H. A.

ANATOMY.

Auld, J. W.
Bonelli, V., B.A.
Bulmer, A. M.
Connor, E. L.
Duggan, R. G.
Gaudet, E. A.
Grimmer, R. D.
Hewitt, T. J.
Joughin, J. L.
King, S. S.
McDonald, J. A.
McDougal, W. L.
McIntosh, G. J.
Morrison, J. C.
Robertson, A. R.
Sawyer, A. R.
Scott, W. J., B.A.
Shipley, C. E.
Somerville, H. A.
Tierney, J. E.

PHYSIOLOGY.

Auld, J. W.
Bonelli, V., B.A.
Connor, E. L.
Duggan, R. G.
Fripp, G. D.
Gaudet, E. A.
Greene, H. B.
Grimmer, R. D.
Joughin, J. L.
King, S. S.
McIntosh, G. J.
Morrison, J. C.
Raftery, C. R.
Robertson, A. R.
Sawyer, A. R.
Scott, W. J., B.A.
Tierney, J. E.

CHEMISTRY.

Auld, J. W.
Bonelli, V., B.A.
Duggan, R. G.
Fripp, G. D.
Gaudet, E. A.
Gourley, H. B., Ph.B.
Greene, H. B.
Grimmer, R. D.
Joughin, J. L.
King, S. S.
Mackid, L. S.
McDonald, J. A.
McIntosh, G. J.
Ralph, A. J., Ph.B.
Raftery, C. R.
Robertson, A. R.
Sawyer, A. R.
Scott, W. J., B.A.
Tierney, J. E.

PRACTICAL CHEMISTRY.

Auld, J. W.
Bonelli, V., B.A.
Connor, E. L.
DesIsles, C. J. R.
Duggan, R. G.
Gaudet, E. A.
Grant, D. J.
Greene, H. B.
Grimmer, R. D.
King, F. C.
McCormick, A. S.
McDougal, W. L.
McIntosh, G. J.
Morrison, J. C.
Robertson, A. R.
Scott, W. J., B.A.
Ship, A. P.
Shipley, C. E.
Somerville, H. A.
Tierney, J. E.

BIOLOGY.

Bonelli, V., B.A.
Gaudet, E. A.
Gourley, H. B., Ph.B.
Greene, H. B.
Grimmer, R. D.
Gunn, A. K.
Hewitt, T. J.
Joughin, J. L.
King, F. C.
King, S. S.
MacGillis, A. F.
Morrison, J. C.
Ralph, A. J., Ph.B.
Raftery, C. R.
Robertson, A. R.
Sawyer, A. R.
Scott, W. J., B.A.
Somerville, H. A.
Tierney, J. E.

BACTERIOLOGY.

Auld, J. W.
Cameron, A. B.
Connor, E. L.
Duggan, R. G.
Fripp, G. D.
Gaudet, E. A.
Gunn, A. K.
Hewitt, T. J.
Joughin, J. L.
King, S. S.
Scott, W. J., B.A.
Shipley, C. E.
Somerville, H. A.
Tierney, J. E.

BOTANY.

Cameron, A. B.
DesIsles, C. J. R.
Mackid L. S.
McCormick, A. S.
McIntosh, G. J
Rilance, C. D.

ZOOLOGY.

Duggan, R. G.

Faculty of Comparative Medicine and Veterinary Science.

PASSED FOR THE DEGREE OF D.V.S.

W. Reid Blair. J. W. Symes. A. D. Harrington.
G. A. Kennedy. Seymour Hadwen. W. Manchester.
W. H. Spear. Alexander R. Douglas.

PRIZES.

Veterinary Medicine and Surgery—A. R. Douglas.
Cattle Pathology—A. D. Harrington.
Materia Medica—A. D. Harrington.
Anatomy—T. C. Hays.
Extra Prizes—For the best essay read before the Veterinary Medical Association: 1st, A. D. Harrington; 2nd, A. R. Douglas; 3rd, W. R. Blair.
For the best essay read before the Psychological Society: 1st, A. D. Harrington; 2nd, A. R. Douglas.

STANDING IN THE SEVERAL SUBJECTS.

VETERINARY MEDICINE AND SURGERY.—THIRD YEAR.

A. R. Douglas. W. R. Blair. J. A. Symes.
A. D. Harrington. Seymour Hadwen. W. H. Spear.

CATTLE PATHOLOGY.—THIRD YEAR.

A. D. Harrington. Seymour Hadwen. W. H. Spear.
A. R. Douglas. W. R. Blair.

PATHOLOGY.—THIRD YEAR.

A. D. Harrington (I). W. R. Blair. Seymour Hadwen
A. R. Douglas (I). W. H. Spear.

MATERIA MEDICA.—THIRD YEAR.

A. D. Harrington. W. R. Blair (II). W. H. Spear.
Seymour Hadwen (II) A. R. Douglas.

ANATOMY.—SECOND YEAR.

T. C. Hays Hugh Gaw.

CHEMISTRY.—SECOND YEAR.

T. C. Hays. Hugh Gaw.

PHYSIOLOGY.—SECOND YEAR.

T. C. Hays Hugh Gaw

PHYSIOLOGY.—FIRST YEAR.

H. Gauvin.

HISTOLOGY.—SECOND YEAR.

Hugh Gaw. T. C. Hays.

HISTOLOGY.—FIRST YEAR.

G. A. Meakins. F. M. Gray.
F. F. Carroll. H. Gauvin.

BOTANY.

H. Gauvin. C. P. Stoote. F. M. Gray.
G. A. Meakins. F. F. Carroll. W. R. Blair.

CYNOLOGY.—THIRD YEAR.

W. R. Blair. Seymour Hadwen. W. H. Spear.
A. R. Douglas. A. D. Harrington.

CYNOLOGY.—SECOND YEAR.

Hugh Gaw.

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SESSION 1901-1902.

EXAMINATION PAPERS

EASTER, 1904–1906.

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" Roman.. .. .. 61.
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" Composition.. .. .. 81.
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MATRICULATION EXAMINATIONS.

FACULTIES OF ARTS, APPLIED SCIENCE AND MEDICINE.

Papers are arranged in the orders of subjects as stated in the Calendar.

MATRICULATION EXAMINATIONS.

ENGLISH GRAMMAR.

FRIDAY, SEPT. 13TH:—MORNING, 9 TO 10.30.

1. (*a*) Parse and analyze: On the top of the hill where the mists gather we saw a cairn.

(*b*) Analyze: I wish that he were here if only he would say so.

2. Define a collective noun. Does it take a verb in the singular or plural? Define an abstract noun. Form abstract nouns from clear, long, just, bond, honest.

3. How is gender indicated in English? Give two examples of each method.

4. State what kind of adjective each of the following is: All, big, half, wise, black. What rules apply to the formation of the comparatives blacker, redder, grayer. Mention two adjectives which do not admit of comparison.

5. Classify and exemplify the Pronouns which can be used as nouns.

6. Put into the passive voice,

(*a*) He liked the man.
(*b*) Forgive me.
(*c*) He asked me for money.
(*d*) He taught me music.

7. Name the imperfect (or incomplete or progressive) perfect and indefinite tenses of the verb *tear*, and give the first person singular of each

8. State what adverbs modify and give examples. To what classes of adverb do *quite, soon, rapidly* belong? Use the words *on, beyond, along*, as prepositions and adverbs.

9. State when the nominative case is used. Give an instance of the ve and the objective genitive.

ENGLISH HISTORY.

FRIDAY SEPTEMBER, 13TH:—MORNING, 10.30 TO 12.

Answer any six questions.

1. Write a full and detailed account of the part which the Danes took in English history from the middle of the ninth century to the accession of Edward the Confessor.

2. Sketch the reign of Henry I.

3. Describe the wars of Edward III. with the Scots and the French.

4. Trace the fortunes of the Yorkist cause from 1450 to the battle of Bosworth.

5. By what stages did England break her connection with the Roman Church? Include in your answer the reigns of Henry VIII., Edward VI., Mary and Elizabeth.

6. Name ten important events in the reign of Charles II.

7. What do you know of the Jacobite plots and risings?

DICTATION.

MONDAY, JUNE 10TH :—MORNING, 10.30 TO 11.

The front part of the house presented a façade of more than sixty windows, surmounted by a formal pediment and raised upon a terrace. A wide avenue, part in gravel, part in turf, and bordered by triple alleys, ran to the great double gateways. It was impossible to look without surprise on a place that had been prepared through so many generations, had cost so many tons of minted gold, and was maintained in order by so great a company of emulous servants. And yet, of these there was no sign but the perfection of their work. The whole domain was drawn to the line and weeded like the front plot of some suburban amateur; and I looked in vain for any belated gardener, and listened in vain for any sounds of labour. Some lowing of cattle and much calling of birds alone disturbed the stillness and even the little hamlet which clustered at the gates, appeared to hold its breath in awe of its great neighbour, like a troop of children who should have strayed into a king's ante-room.

[Note for the Presiding Examiner.—The Deputy Examiner will read the extract *three* times, the candidates writing it out during the *second* reading. The first and third readings are respectively intended to give the candidates a general idea of the character of the passage, and to guide them in punctuating, *As it is of great importance that candidates should not be left in a state of uncertainty, the Deputy Examiner will repeat, on request, any word or phrase The Deputy Examiner will also inform the candidate that obvious attempts to make letters do double duty (e. g. to make a letter serve for e or i) will be regarded as mistakes. Full stops and semi-colons are to be indicated by the Deputy Examiner.*

ENGLISH LITERATURE AND COMPOSITION.

FRIDAY, SEPTEMBER, 13TH :—AFTERNOON, 2.30 TO 5.30.

(Candidates will take A and either B or C. Ontario candidates may substitute D for either A or B or C. All candidates must take E, except those who have entered for First Year Exhibitions who will take the paper on Milton. Write the answers to the several parts in separate books).

A. SHAKSPERE—*Richard II.*

1. Describe in your own words the opening scene. Quote and scan ten consecutive lines from the first act.

2 Review carefully the Duke of York's course of action in the play. What deductions may be made as to his character and opinion?

3 Explain the following passages, and state by whom and on what occasion they are spoken:—

(*a*) 'Twill make me think the world is full of rubs,
And that my fortune runs against the bias.
(*b*) The sly slow hours shall not determinate
The dateless limit of thy dear exile.
(*c*) Twice saying 'pardon' doth not pardon twain,
But makes one pardon strong.
(*d*) The very bandsmen learn to bend their bows
Of double-fatal yew against thy state;
Yea, distaff-women manage rusty bills against thy state.
(*e*) I wasted time, and now doth time waste me;
For now hath time made me his numbering clock.

B. Scott—*Lady of the Lake.*

1. Give a summary of the events contained in the last canto of the poem.

2. Write your impressions of Highland character as described in *The Lady of the Lake*; and give short quotations to support your answer.

3. Note and explain carefully six old Scottish words used by Scott in this poem.

4. Who were:—Allanbane, Red Murdock, Blanche of Alevon?

C. Tennyson—*Selections.*

1. Where do we find the foundation of each of the following poems: *The Lotos-Eaters*, *Ulysses*, *Tithonus*. In each case, outline the classic story and show how Tennyson has altered it.

2. Explain the meaning of *The Lady of Shalott.*

3. Quote or refer explicity to passages in Tennyson's poems illustrating the following characteristics: richness of description, simplicity of diction, assonance, skill in similes, patriotic feeling.

D. Tennyson—*Selections.*

1. (*a*) Give the legend of *Sir Galahad.*
(*b*) How does Tennyson treat the story?
(*c*) What characteristics of Tennyson, as poet and as man, do you find illustrated in the poem?

2. Write out or give a prose rendering of any one of the songs from *The Princess*, and add a short comment.

3. Judging from his poems, what can you say of Tennyson's religion; his patriotism; his feeling for the classics? Illustrate by quotations or direct references.

E. English Composition.

Write an essay of not less than two pages on any *one* of the following subjects:—

A. Summer Reading.

B. The Joys and Sorrows of a Fisherman.

C. The Character of Ulysses as presented by Tennyson.

MATHEMATICS, PART I.

GEOMETRY.

Thursday, September 12th.—Morning, 9 to 12.

1. If a side of a triangle be produced, then the exterior angle shall be equal to the two interior opposite angles; also the three interior angles of a triangle are together equal to two right angles.

(*a*) All the interior angles of any rectilineal figure, together with four right angles, are equal to twice as many right angles as the figure has sides.

2. Triangles upon the same base and between the same parallels are equal in area.

3. If a straight line be divided equally and also unequally, the rectangle contained by the unequal parts, together with the square on the line between the points of section, is equal to the square on half the line.

4. Describe a square that shall be equal to a given rectilineal figure.

5. The sum of the squares on the sides of a parallelogram is equal to the sum of the square on the diagonals.

6. In a right angled triangle, if a perpendicular be drawn from the right angle to the hypotenuse the square on the perpendicular is equal to the rectangle contained by the segments of the hypotenuse.

7. Equal chords in a circle are equidistant from the centre.

(*a*) Find the locus of the middle points of equal chords in a circle.

8. The opposite angles of a quadrilateral inscribed in a circle are together equal to two right angles.

9. If two chords of a circle cut one another, the rectangle contained by the segments of the one shall be equal to the rectangle contained by the segments of the other.

MATHEMATICS, PART I.

ALGEBRA AND ARITHMETIC.

THURSDAY, SEPTEMBER 12TH:—AFTERNOON, 2 TO 5.

1. Simplify (*a*) $\frac{a+x}{a^2+ax+x^2} + \frac{a-x}{a^2-ax+x^2} + \frac{2x^3}{a^4+a^2x^2+x^4}$

(*b*) $(1+x)^2 \div \left\{1 + \frac{x}{1-x+\frac{x}{1+x+x^2}}\right\}$

2. Resolve into factors:

(1) $x^2 - 20xy + 96y^2$.

(2) $a^4 + 7a^2 - 98$.

(3) $2mn + m^2 + n^2 - 1$.

(4) $x^8 - \frac{1}{256}$.

3. Solve the following equations:

(1) $\frac{x+4}{14} + \frac{x-4}{6} = 2$,

(2) $\begin{cases} \frac{2}{5}x - \frac{1}{12}y = 3, \\ 4x - y = 20. \end{cases}$

(3) $22x + 23 - x^2 = 0$.

4. Two persons, 27 miles apart, setting out at the same time are together in 9 hours if they walk in the same direction, but in 3 hours if they walk in opposite directions. Find their rates of walking.

5. Solve the following equations.

(1) $\frac{6x+8}{2x+1} - \frac{2x+38}{x+12} = 1$

(2) $\frac{5}{x-2} - \frac{4}{x} = \frac{3}{x+6}$

(3) $\begin{cases} x^3 - y^3 = 127 \\ x^2y - xy^2 = 42 \end{cases}$

6. The perimeter of one square exceeds that of another by 100 feet; and the area of the larger square exceeds three times the area of the smaller by 325 square feet: find the length of the sides.

7. Prove (1) $a^0 = 1$

(2) $a^m \times a^n = a^{m+n}$

(3) $a^{\frac{m}{n}} = \sqrt[n]{a^m}$.

Rationalize the denominator of

$$\frac{10\sqrt{6} - 2\sqrt{7}}{3\sqrt{6} + 2\sqrt{7}}$$

8. A merchant who sold goods at an average profit of 12 p.c. made a profit of $2,814 in a year. What was the amount of his sales.

9. The floor of an assembly hall is 70 feet long and 55 feet wide. How long will the line be that will divide it into two right-angled triangles.

10. Find the difference between the simple and compound interest on $1,500 for 5 years at 6 p.c.

11. Find the area of the floor of question 9 in square metres.

MATHEMATICS, *PART II.*

TUESDAY, SEPT. 17TH:—MORNING, 9 TO 12.30.

GEOMETRY.

1. (1) Inscribe a circle in a given triangle.

(2) Inscribe a circle in a quadrant of a circle of radius a.

(3) Show that the radius of the circle required in (2) is $(\sqrt{2}-1)\,a$.

2. Describe a circle about a given regular pentagon.

3. (1) Find a third proportional to two given straight lines.

(2) OA is a tangent to a circle, OB a line which meets the circle in B and C. Show that OC is a third proportional to OB and OA.

4. In a right-angled triangle any rectilineal figure described on the hypotenuse is equal to the sum of the similar and similarly described figures on the sides.

ALGEBRA.

5. What are duplicate ratio and subduplicate ratio? If the subduplicate ratio of $P-x : Q-x$ be $P : Q$, prove that $x = \dfrac{PQ}{P+Q}$

6. Give the definitions of the three progressions, and find the arithmetic, geometric, and harmonic means between a and b. Why is the geometric mean of a and b, also the geometric mean of the other means?

7. (1) Find the number of combinations of n distinct things taken r at a time.

(2) Show that ${}^{n}C_{r} + {}^{n}C_{r-1} = {}^{n+1}C_{r}$.

8. (1) How many words can be formed by using all the letters of the word *edible*?

(2) How many of these words begin and end with e?

(3) How many neither begin nor end with e?

9. Find the third term of $(1+2x)^{\frac{11}{2}}$.

TRIGONOMETRY.

10. What units are commonly employed in the measurement of angles? Find the number of degrees in a radian (unit of circular measure).

11. Express the cosines of $90° + A$, $180° + A$, and $270° + A$ in terms of the ratios of A.

12. Prove that

(1) $\sin (A - B) = \sin A \cos B - \cos A \sin B$,

(2) $\sin A + \sin B = 2 \sin \frac{A + B}{2} \cos \frac{A - B}{2}$.

13. Solve the following equations for angles less than 180°:—

(1) $\tan x + \cot x = 2$,

(2) $\cos^2 x + 2 \sin x = \frac{7}{4}$.

14. Show that

(1) $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2 \theta$,

(2) $\tan^2 \theta + \cot^2 \theta = \sec^2 \theta \operatorname{cosec}^2 \theta - 2$,

(3) $\frac{1 - \cos \theta}{\sin \theta} = \frac{\sin \theta}{1 + \cos \theta} = \tan \frac{\theta}{2}$,

(4) $\frac{\cos 9° + \sin 9°}{\cos 9° - \sin 9°} = \tan 54°$.

LATIN.

WEDNESDAY, SEPTEMBER 11TH :—MORNING, 9 TO 12

I. TRANSLATION FROM PRESCRIBED AUTHORS.

Candidates for Matriculation will do any two of A, B and C, and D or E; Candidates for Exhibitions will do any two of A, B and C, D or E, and F or G.

A. CAESAR, BK. I.

Dum haec in colloquio geruntur, Caesari nuntiatum est equites Ariovisti propius tumulum accedere et ad nostros adequitare, lapides telaque in nostros conicere. Caesar loquendi finem facit, seque ad suos recepit suisque imperavit ne quod omnino telum in hostes reicerent. Nam etsi sine ullo periculo legionis delectae cum equitatu proelium fore videbat, tamen committendum non putabat ut pulsis hostibus dici posset eos ab se per fidem in colloquio circumventos. Posteaquam in vulgus militum

elatum est, qua arrogantia in colloquio Ariovistus usus omni Gallia Romanis interdixisset, impetumque in nostros eius equites fecissent, eaque res colloquium ut diremisset, multo maior alacritas studiumque pugnandi maius exercitui iniectum est.

Account for the case, or mood and tense, of the following: *geruntur, tumulum, reicerent, videbat, committendum, elatum est, arrogantia, omni Gallia, Romanis, exercitui.*

B. Caesar, Bk. II.

Ubi vero moveri et appropinquare moenibus viderunt, nova atque inusitata specie commoti legatos ad Caesarem de pace miserunt, qui ad hunc modum locuti: Non existimare Romanos sine ope divina bellum gerere, qui tantae altitudinis machinationes tanta celeritate promovere et ex propinquitate pugnare possent, se suaque omnia eorum potestati permittere dixerunt. Unum petere ac deprecari: si forte pro sua clementia ac mansuetudine, quam ipsi ab aliis audirent, statuisset Aduatucos esse conservandos, ne se armis despoliaret. Sibi omnes fere finitimos esse inimicos ac suae virtuti invidere, a quibus se defendere traditis armis non possent. Sibi praestare, si in eum casum deducerentur, quamvis fortunam a populo Romano pati quam ab his per cruciatum interfici inter quos dominari consuessent.

Account for the construction of *moenibus, locuti, altitudinis, audirent, despoliaret, virtuti, armis, deducerentur, pati, consuessct.*

C. Caesar, Bk. III.

Quo proelio bellum Venetorum totiusque orae maritimae confectum est. Nam cum omnis iuventus, omnes etiam gravioris aetatis, in quibus aliquid consilii aut dignitatis fuit, eo convenerant, tum navium quod ubique fuerat in unum locum coegerant; quibus amissis reliqui neque quo se reciperent neque quemadmodum oppida defenderent habebant. Itaque se suaque omnia Caesari dediderunt. In quos eo gravius Caesar vindicandum statuit, quo diligentius in reliquum tempus a barbaris ius legatorum conservaretur. Itaque omni senatu necato reliquos sub corona vendidit.

Account for the case, or mood and tense, of the following words: *proelio, ætatis, consilii, reciperent, defenderent, eo, navium, vindicandun, conservaretur, necato.*

D. Virgil, Bk. I.

Haec dum Dardanio Aeneae miranda videntur,
dum stupet, obtutuque haeret defixus in uno,
regina ad templum, forma pulcherrima Dido,
incessit, magna iuvenum stipante caterva.
Qualis in Eurotae ripis, aut per iuga Cynthi
exercet Diana choros, quam mille secutae
hinc atque hinc glomerantur Oreades: illa pharetram
fert humero, gradiensque deas supereminet omnes;
Latonae tacitum pertentant gaudia pectus:
talis erat Dido, talem se laeta ferebat
per medios, instans operi regnisque futuris.

(*a*) Scan the first two lines.

(*b*) Write a brief note on the following words or phrases: *Tyrrhenum æquor, Syrtes, Cerealia arma, Punica regna, Penates, Oenotri viri, relliquias Danaum, et vos celebrate faventes, urbem Patavi, rapti Ganymedis honores.*

E. Virgil, Bk. II.

Hic mihi nescio quod trepido male numem amicum
confusam eripuit mentem. Namque avia cursu
dum sequor, et nota excedo regione viarum,
heu! misero coniunx fatone erepta Creüsa
substitit, erravitne via, seu lassa resedit,
incertum; nec post oculis est reddita nostris.
Nec prius amissam respexi, animumve reflexi,
quam tumulum antiquæ Cereris sedemque sacratam
venimus. Hic demum, collectis omnibus, una
defuit, et comites, natumque, virumque fefellit.

(*a*) Scan the third and fourth lines.

(*b*) Write a brief note on the following words or phrases: *Tenedos, donum exitiale Minervae, Palladium, intonuit laevum, Tritonia, Sigea freta, Erinys, gemini Atridae, Scyria pubes, Lucifer.*

F. Horace, Odes, I.

1. Post ignem aetheria domo
subductum macies et nova febrium
terris incubuit cohors,
semotique prius tarda necessitas
leti corripuit gradum.
Expertus vacuum Daedalus aera
pennis non homini datis;
perrupit Acheronta Herculeus labor.

(*a*) Give the several myths alluded to in these lines.

(*b*) Scan the last line, and note any peculiarities of metre.

2. Nuper sollicitum quae mihi taedium,
nunc desiderium curaque non levis,
interfusa nitentis
vites aequora cycladas.

3. Nunc est bibendum, nunc pedé libero
pulsanda tellus, nunc Saliaribus
ornare erat dapibus, sodales.
tempus erat dapibus, sodales.

(*a*) Give the outline of the thought of the two odes from which extracts 2 and 3 are taken.

(*b*) What is the date of the composition of each of these two odes?

(*c*) Describe the metre of the last two extracts.

G. Cicero, Catiline, I, II.

Haecsi tecum, ut dixi, patria loquatur, nonne impetrare debeat, etiam si vim adhibere non possit? Quid, quod tu te ipse in custodiam dedisti? quod vitandae suspicionis causa, ad M.' Lepidum te habitare velle dixisti?

a quo non receptus etiam ad me venire ausus es, atque ut domi te adservarem rogasti. Cum a me quoque id reponsum tulisses, me nullo modo posse isdem parietibus tuto esse tecum, quo magno in periculo essem quod isdem moenibus contineremur, ad Q. Metellum praetorem venisti.

(*a*) Account carefully for the use of each subjunctive in this passage.

(*b*) Remark on the meaning of the phrase *in custodiam dedisti*. (*c*) Give the rule of Syntax for the construction of *domi meae*, *parietibus*, and *moenibus*.

O fortunatam rem publicam, si quidem hanc sentinam urbis eiecerit! Uno (mehercule) Catilina exhausto, levata mihi et recreata res publica videtur. Quid enim mali aut sceleris fingi aut cogitari potest quod non ille conceperit? Nemo non modo Romae, sed ne ullo quidem in angulo totius Italiae oppressus aere alieno fuit, quem non ad hoc incredibile sceleris foedus asciverit. Atque ut eius diversa studia in dissimili ratione perspicere possitis, nemo est in ludo gladiatorio paulo ad facinus audacior qui se non intimum Catilinae esse fateatur; nemo in scaena levior et nequior, qui se non eiusdem prope sodalem fuisse commemoret.

Write brief notes on : *Carcer Tullianum*, *custodiae vigiliaeque*, *colon; municipesque*, *prid*, *kalendas Januarias*, *Juppiter Stator*, *patres conscripti*, *Palatium*.

II. TRANSLATION AT SIGHT.

Candidates for Matriculation will translate A : Candidates for Exhibitions, A and B.

A.

CICERO TREBATIO.

Ego te commendare non desisto, sed quid proficiam ex te scire cupio. Spem maximam habeo in Balbo, ad quem de te diligentissime et saepissime scribo. Illud soleo mirari, non me totiens accipere tuas litteras quotiens, a Quinto mihi fratre adferantur. In Britannia nihil esse audio neque auri neque argenti. Id si ita est essedum aliquod capias suadeo et ad nos quam primum recurras. Sin autem sine Britannia tamen adsequi quod volumus possumus, perfice ut sis in familiaribus Caesaris. Multum te in eo frater adiuvabit meus, multum Balbus, sed mihi crede, tuus pudor et labor plurimum. Imperatorem habes liberalissimum aetatem opportunissimam, ut tibi unum timendum sit, ne ipse tibi defuisse videare.

B.

Olim, quas vellent esse in tutela sua,
divi legerunt arbores, quercus Iovi,
at myrtus Veneri placuit, Phoebo laurea,
pinus Cybebae, populus celsa Herculi.
Minerva admirans, quare steriles sumerent,
interrogavit. causam dixit Juppiter :
'honorem fructu ne videamur pendere.'
'at, mehercules, narrabit quod quis voluerit:
oliva nobis propter fructum est gratior'
tunc sic deorum genitor atque hominum sator:
'O nata, merito sapiens dicere omnibus!
nisi utile est quod facimus, stulta est gloria.'
Nihil agere, quod non prosit, fabella admonet.

LATIN

WEDNESDAY, SEPTEMBER 11TH:—AFTERNOON, 2 TO 5.

I. LATIN GRAMMAR.

Candidates for Matriculation may omit 8, 9, 11 *and* 12; *Candidates for Exhibitions may omit* 1, 3 and 7.

1. Decline together *magnus clamor, omne genus, vir sapiens, summa quercus, haec avis, alter pes.*

2. Give the Gender, the Ablative Singular and Genitive Plural of *navis, senex, nox, vis, animal, domus, dies.*

3. Give the Comparative and Superlative of *felix, pauper, magnificus, malus, iuvenis.*

4. Write down the Latin for *eighteen, 50th, 1000 men, 2000 men, in the year* 1882, *one epistle, two epistles.*

5. Give the principal parts of *capio, patior, gaudeo, pello, augeo, gigno sentio, posco, obliviscor, haereo.*

6. Give the 1 Per. Sing. Pres. Subj. of *eo, moneo, scribo, vereor, miror.* 3 Per. Pl. Perf. Indic. Act. of *capio, cresco, scribo, iuvo.* Pres. and Fut. Imperative Act. and Pass. of *audio.* 2 Per. Sing. Imperf. Pass. of *rego, vincio, veto, moneo*

7. Name the prepositions which govern the Ablative. Which of these is regularly placed after its case? Which occasionally?

8. Give examples in Latin of (*a*) Accus. of Limit of Motion, (*b*) Greek Accusative, (*c*) Intransitive Verbs used in the Passive, (*d*) Ethical Dative, (*e* Appositional Genitive. (*f*) Ablative of Accompaniment, (*g*) Substantive Clause of Result, (*h*) Indirect Double Question.

9. Name the Particles which are always or regularly post-positive.

10. Mark by the usual sign all the long vowels in the following words:—*triginta, fere, bene, nolis, proficisci, quamvis, infans, diei, fieri, totius, mihi.*

11. Express in Latin the following dates: Jan. 25; Mar. 4; Sept. 10; B.C. 63.

12. (*a*) What is the difference between an English and Roman mile? (*b*) Explain the following grammatical terms:—Brachylogy, Hendiadys Pleonasm, Protasis, Zeugma.

II. LATIN PROSE COMPOSITION.

Candidates for Matriculation will do the first six only.

1. Tell me why you are afraid.

2. We were sent to ask for peace.

3. Now they were ready for braving all dangers.

4. When they attempted to cross the Rhone, Caesar set out from Rome.

5. So popular was he with the soldiers, that they gladly followed him.

6. (*To be done first in Oratio Recta, then in Oratio Obliqua.*) He said that he had ten legions ready; moreover, he had ascertained that Caesar was unpopular with the soldiers, and that they could not be persuaded to follow him. He urged that troops should be levied throughout Italy, that Sulla should be sent to Sicily, that money should be given to Pompeius to carry on the war. (Or. Rect., I have ten legions, ready, etc.)

7. They sailed from Palos, August 3. It took them a month to reach the Canary Islands; but after they had passed those, and found themselves on the lonely ocean at night, many of the sailors wept and declared they never should return. Columbus quieted them, and they sailed on day by day, sometimes hopeful, and sometimes mutinous. Once the sailors plotted to throw Columbus overboard. Often they thought they saw signs of land; once they were sure of it, and it proved only a cloud. Finally one evening at ten o'clock Columbus saw a light glimmering across the water, and the next morning from one of the smaller vessels was heard the signal agreed upon for "making land."

GREEK AUTHORS.

WEDNESDAY, SEPTEMBER 18TH :—MORNING 10 TO 12.

Candidates should write on A (1) or A (2).

In addition to translation, notes are required on words and phrases underlined, including full parsing of nouns and verbs.

A (1) XENOPHON, ANABASIS.

(α) Εκάλεσε δε καὶ τοὺς Μίλητον πολιορκοῦντας, καὶ τοὺς φυγάδας ἐκέλευσε σὺν αὐτῷ στρατεύεσθαι, ὑποσχόμενος αὐτοῖς, εἰ καλῶς καταπράξειεν ἐφ' ἃ ἐστρατευετο, μὴ πρόσθεν παύσεσθαι πρὶν αὐτούς καταγάγοι οἴκαδε.

(β) ἔνθα δὴ μέρος τι τῆς εὐταξίας ἦν θεάσασθαι. ῥψαντες γὰρ τοὺς πορφυροῦς κάνδυς ὅπου ἔτυχεν ἑκάστηκώς, ἵεντο ὥσπερ ἄν δράμοι τις περὶ νίκης καὶ μάλα κατὰ πρανοῦς γηλόφου, ἔχοντες τούς τε πολυτελεῖς χιτῶνας καὶ τὰς ποικίλας ἀναξυρίδας, ἔνιοι δὲ καὶ στρεπτοὺς περί τοῖς τραχήλοις καὶ ψέλια περὶ ταῖς χερσίν· εὐθὺς δὲ σὺν τούτοις εἰσπηδήσαντες εἰς τόν πηλόν θᾶττον ἢ ὥς τις ἄν ᾠετο μετεώρους ἐξεκόμισαν τὰς ἁμάξας.

(γ) καὶ γὰρ ᾔδει αὐτὸν ὅτι μέσον ἔχοι τοῦ Περσικοῦ στρατεύματος. καὶ πάντες δ' οἱ τῶν βαρβάρων ἄρχοντες μέσον ἔχοντες τὸ αὐτῶν ἡγοῦνται, νομίζοντες οὕτω καὶ ἐν ἀσφαλεστάτῳ εἶναι, ἢν ᾖ ἡ ἰσχὺς αὐτῶν ἑκατέρωθεν, καὶ εἴ τι παραγγεῖλαι χρῄζοιεν, ἥμισει ἂν χρόνῳ αἰσθάνεσθαι τὸ στράτευμα.

A (2) Xenophon, Anabasis II.

(α) καὶ εἴ τις αὐτῷ δοκοίη τῶν πρὸς τοῦτο τεταγμένων βλακεύειν, ἐκλεγόμενος τὸν ἐπιτήδειον ἔπαισεν ἄν, καὶ ἅμα αὐτὸς προσελάμβανεν εἰς τὸν τηλὸν ἐμβαίνων· ὥστε πᾶσιν αἰσχύνην εἶναι μὴ οὐ συσπουδάζειν.

(β) οὐ μὲν δὴ ἂν μάχεσθαί γε δέῃ ἱππεῖς εἰσιν ἡμῖν σύμμαχοι, τῶν δὲ πολεμίων ἱππεῖς εἰσιν οἱ πλεῖστοι καὶ πλείστου ἄξιοι· ὥστε νικῶντες μὲν τίνα ἂν ἀποκτείναιμεν; ἡττωμένων δὲ οὐδένα οἷόν τε σωθῆναι. ἐγὼ μὲν οὖν βασιλέα, ᾧ οὕτα πολλά ἐστι τὰ σύμμαχα, εἴπερ προθυμεῖται ἡμᾶς ἀπολέσαι, οὐκ οἶδα ὅ,τι δεῖ αὐτὸν ὀμόσαι καὶ δεξιὰν δοῦναι καὶ θεοὺς ἐπιορκῆσαι καὶ τὰ ἑαυτοῦ πιστὰ ἄπιστα ποιῆσαι Ἕλλησι τε καὶ βαρβάροις.

(γ) καὶ γὰρ οὖν φιλίᾳ μέν καὶ εὐνοίᾳ ἑπομένους οὐδέποτε εἶχεν· οἵτινες δὲ ἢ ὑπο πόλεως τεταγμένοι ἢ ὑπὸ τοῦ δεῖσθαι ἢ ἄλλῃ τινὶ ἀνάγκῃ κατεχόμενοι παρείησαν αὐτῷ, σφόδρα πειθομένοις ἐχρῆτο. ἐπεὶ δέ ἄρξαιντο νικᾶν σὺν αὐτῷ τοὺς πολεμίους, ἤδη μεγάλα ἦν τὰ χρησίμους ποιοῦντα εἶναι τοὺς σὺν αὐτῷ στρατιώτας.

GREEK GRAMMAR, COMPOSITION, HIGHER TRANSLATION AT SIGHT AND HIGHER COMPOSITION.

WEDNESDAY, SEPTEMBER 18TH:—AFTERNOON, 2 TO 5.

A. 1. Give accusative Singular and Dative Plural of: πατήρ, ναῦς, πᾶς (all genders), λεώς, λέων, χάρις, ἐλπίς, πόλις, πολύς (all genders).

2. Give comparative and superlative of πρόθυμος, ἐχθρός, εὖ, σώφρων.

3. Give 3rd plural perf. ind. pass; 2nd sing. imperf. mid; 1st plur. aor. ind. act; 2nd plural fut. ind. mid.; Dat. plur. masc. aor. part. pass; perfect. inf. act; of νικάω, καθίστημι, τρέφω, αἱρέω

3. With what cases are the following prepositions used, and with what differences of meaning: μετά, ἐπί, πρός, κατά?

B. Translate into Greek:

1. The whole army crossed the river.
2. They called together the King's own army.
3. I saw that many things had to be done by me.
4. Hearing this, the same soldiers were unwilling to obey their generals.
5. He said that they ought to guard against the Persian cavalry.
6. It is not possible to obtain supplies thence.
7. We will send messengers bearing letters to all who are still absent.
8. He made them rulers of the cities which he had captured.

FRENCH.

MONDAY, 16TH SEPTEMBER:—MORNING, 9 TO 12.

I. Translate into good English (at sight).

1. IMPRÉCATIONS DE CAMILLE.

Rome, l'unique objet de mon ressentiment!
Rome à qui vient ton bras d'immoler mon amant!
Rome qui t'a vu naître, et que ton cœur adore!
Rome enfin que je hais, parce qu'elle t'honore!
Puissent tous ses voisins, ensemble conjurés,
Saper ses fondements, encor mal assurés!
Et, si ce n'est assez de toute l'Italie,
Que l'Orient contre elle à l'Occident s'allie!
Que cent peuples, unis des bouts de l'univers,
Passent, pour la détruire, et les monts et les mers!
Qu'elle-même sur moi renverse ses murailles,
Et de ses propres mains déchire ses entrailles!
Que le courroux du Ciel, allumé par mes vœux,
Fasse pleuvoir sur elle un déluge de feux!
Puissé-je de mes yeux y voir tomber la foudre,
Voir ses maisons en cendre et tes lauriers en poudre,
Voir le dernier Romain à son dernier soupir,
Moi seule en être cause, et mourir de plaisir!

CORNEILLE.

"Au golfe Juan, le 1er mars, 1815.

2. "Napoléon, par la grâce de Dieu et les constitutions de l'empire :
Empereur des Français, etc., etc.

À L'ARMÉE.

"Soldats !

"Nous n'avons pas été vaincus ! Deux hommes sortis de nos rangs ont trahi nos lauriers, leur pays, leur prince, leur bienfaiteur.

"Ceux que nous avons vus pendant vingt-cinq ans parcourir toute l'Europe pour nous susciter des ennemis ; qui ont passé leur vie à combattre contre nous dans les rangs des armées étrangères en maudissant notre belle France, prétendraient-ils commander et enchaîner nos aigles, eux qui n'ont jamais pu en soutenir les regards ? Souffrirons-nous qu'ils héritent du fruit de nos glorieux travaux ? Qu'ils s'emparent de nos honneurs, de nos biens ; qu'ils calomnient notre gloire ? Si leur règne durait, tout serait perdu, même le souvenir de ces immortelles journées !

"Avec quel acharnement ils les dénaturent, et cherchent à empoisonner ce que le monde admire ! S'il reste encore des défenseurs de notre gloire, c'est parmi ces mêmes ennemis que nous avons combattus sur le champ de bataille.

"Soldats ! dans mon exil j'ai entendu votre voix. Je suis arrivé à travers tous les obstacles et tous les périls.

"Votre général, appelé au trône par le choix du peuple et élevé sur vos pavois, vous est rendu : venez le joindre.

"Arrachez ces couleurs que la nation a proscrites et qui, pendant vingt-cinq ans, servirent de ralliement à tous les ennemis de la France. Arborez cette cocarde tricolore ; vous la portiez dans nos grandes journées.

II. Translate into French (at sight).

A VISIT TO LONDON.

It is eight years since I was in London. London was not then as big as it is now, but it was already beyond dispute (sans question) the largest town in the world and the richest ; in my opinion it was also and still is more interesting than any other European capital. Paris has perhaps more memories. Rome is immensely rich in antiquities, but London has a charm of its own, which one does not understand at first sight, but which reveals itself to those who have open minds.

I wish I had kept more time for the galleries, the *National* is so full of great and interesting paintings by the masters of the last four centuries, that one could profitably spend a month in ranging through its rooms, I do not wish to say that if I had a month at the present time, I should devote the whole of it to pictures. I think that it is much more profitable to bestow a day here and a day there on art than to give oneself up to it entirely for a longer period.

III. 1. State the rules for the agreement of the past participle in the case of verbs which take the auxiliary *avoir*.

2. Replace by any appropriate simple tense the following infinitives in italics :

Alexandre *mourir* à la fleur de l'âge. Eve *cueillir* et *manger* du fruit défendu. Nous *partir* de grand matin, nous *parcourir* le bois, nous *cueil-*

lir des noisettes, vous *survenir*, nous *tressaillir* de joie, nous *partager* notre récolte. Alexandre et Napoléon *concevoir* et *exécuter* de grandes choses.

3. When are *vingt* and *cent* variable, and when invariable? Give examples?

4. Correct the following sentences, giving reasons for corrections.
   (*a*) Je veux que vous faites ce travail.
   (*b*) L'enfant doit respecter et obéir à ses parents.
   (*c*) Religion prêche charité à tous hommes.

GERMAN.

MONDAY, 16TH SEPTEMBER:—AFTERNOON, 2 to 5.

I. Translate into good English :—

„Pfui!" sagte sie erschrocken, „was ist das für ein alter, garstiger Koffer; mit dem darf man sich gar nicht einlassen!" Wenn sie später Jemand nach dem Koffer fragte, mit dem ihr Herr so geheim thue, und ob nicht irgend etwas Besonderes daran sei, erwiderte sie: es sei gar nichts an dem alten Koffer und darin noch weniger. Jeder Mensch habe seine Eigenheiten, besonders was alte, unverheiratete Leute seien. Ihr Herr habe nun einmal sein Herz an den alten struppigen Koffer gehängt; weiter sei es nichts.

Aber es war doch etwas Besonderes in dem Koffer. Denn zuweilen riegelte der alte Herr vorsichtig sämmtliche Zimmerthüren zu, druckte auf die geheime Feder, so daß der Deckel aufsprang, horchte dann noch einmal, ob alles draußen still wäre, und wenn er Niemanden hörte, hob er den roten Sammtkasten aus dem Koffer heraus und setzte ihn vor sich auf den Tisch. Darauf drückte er auf eine zweite verborgene Feder am Kasten und der rote Sammtdeckel sprang auch auf.

(2) Weiße Stufen führten aus dem todstillen Wasser in eine große, offen stehende Halle, welche von vielen Säulen von blauem und grünem Krystall mit goldenen Knäufen getragen wurde, und in buntem Gewirr tanzten in dieser Halle eine unzählbare Menge von Irrlichtern um ein besonders hell flackerndes, hoch aus ihrer Mitte hervorschwebendes Flämmchen herum. Da lösten sich plötzlich aus dem Gewühl eine Anzahl Irrlichter ab und bildeten zwei Kreise, die wirbelnd aus der Halle hervorstürzten. Und während der eine von ihnen dicht vor den Stufen des Schlosses stehen blieb, näherte sich der andere rasch und bald erkannte Blau-

änglein zwölf blasse, aber wunderschöne Jungfrauen, welche auf der Stirn goldene Diademe trugen, an denen sich vorn kleine goldene Schalen erhoben, worin die blauen Flämmchen brannten. In wildem Tanze schwebten sie an Blauänglein heran und umringten sie; und während aus dem Schlosse eine zauberische Musik erklang, sangen sie:

II. Translate into good English (at sight).

Fritz öffnete die Hausthür, riß aber rasch den Hut vom Kopf, als er sich plötzlich schon in der Stube des Majors und diesem gegenüber sah. Der alte Herr ging mit auf den Rücken gelegten Händen in seiner Stube auf und ab, blieb aber mitten in seinem Spaziergang stehen und sah sich erstaunt nach der Thür um. „Ich muß tausendmal um Entschuldigung bitten, mein Herr," sagte Fritz, erschreckt; „aber ich glaubte nicht, daß die Thür direkt in Ihr Zimmer führte, und habe einmal erst angeklopft." "Bitte, keine Entschuldigung," sagte der alte Soldat, eine stattliche Gestalt mit schneeweißem Bart; „wünschen Sie mich zu sprechen und mit was kann ich Ihnen dienen?"

III. Translate into German:—

(1) I beg your pardon, sir; I hope I have not in my haste given you the other gentleman's hat.

(2) The princess thought the whole morning about the song she had heard.

(3) I do not know what I should have done, if I had not thought of you.

(4) The battle of Bunker Hill was fought on the 17th of June, 1775.

(5) Allow us one prayer, said the geese, that we die not in our sins; afterwards we will stand in a row that you may pick out the fattest.

(6) That is the curse of kings, that they, divided, tear the world asunder.

(7) An old man, who journeyed to America in his youth, married there, brought up a large family, and in his old age went back to Germany and died here recently.

(8) Dear Mother,—Uncle Charles was here yesterday evening and brought me your letter with the money. I thank you for it very much. May I give some of it to Hans? But you don't know my new friend yet. We live near each other, and go to school together. Hans often helps me with my work, and I help him when we play (at) soldiers and make war on the other boys. They made me general lately. But it is not true, dear mamma, that I have been lazy this year. I have done my lessons every day, but the teacher often puts us very hard questions that none of us can answer, except Hans and one or two others.

IV. (1) Compose good German sentences containing (*a*) the adverbs *am besten, aufs beste*; (*b*) an inseparable compound verb, a separable compound verb; (*c*) the genitive of any relative pronoun; (*d*) a verb in the passive voice; (*e*) a conditional subjunctive; (*f*) an instance of *transposed order*, of *inverted order*.

V. Give the principal parts of the following verbs: *let, command, hew, seize, suffer, lose, recommend, bring, offer, request, hide, eat, fall, come, burn, run, call, measure, whistle, do.*

PHYSIOGRAPHY.

TUESDAY, SEPTEMBER 17TH:—AFTERNOON, 2 TO 3.30.

1. Explain with diagrams the variation in the attitude of the sun at noon at different seasons of the year.

2. What is an "isotherm." Draw on a map of Canada the isotherms corresponding to the mean winter and mean summer temperature of Montreal. Account for the difference in climate of Vancouver anp Montreal.

3. State clearly why a sudden fall of the barometer is an indication of unsettled weather.

4. Explain the cause and formation of (1) dew, (2) fog, (3) hail.

5. State what you know of the nature and mode of formation of the diamond, coal and coral.

6. What are the trade winds and how are they caused?

Show diagrammatically on a map the prevailling direction of the winds in the Atlantic Ocean about the beginning of the year.

7. State what you know of the following:—doldrums, mirage, bore, atoll, sirocco, iceberg.

BOTANY.

MONDAY, SEPTEMBER 17TH :—AFTERNOON, 2 TO 5.

1. Compare a wheat grain and a bean seed, giving a full account of the germination of each.

2. Write a short account of the arrangement of leaves.

3. Distinguish between the Angiospermae and the Gymnospermae, and describe a member of the latter class.

4. Give an account of the principal modifications of the flower which ensure cross-fertilization, mentioning an example of each.

5. State what you know of the methods of plant dispersion through the seeds and fruits.

6. Describe the movement of water in plants, and the various adaptations which are designed to regulate it.

7. State what you can respecting the periodic movements of leaves and flowers.

8. Describe fully, giving the scientific names of the species, genera and families, two of the following plants :—

(*a*) The round-leaved mallow.

(*b*) Self-heal.

(*c*) The lady's-slipper orchid.

CHEMISTRY.

TUESDAY, SEPT. 17th :—MORNING, 9 TO 12.

1. How may Nitrogen be obtained from the air? What are its properties? Name four chemical compounds of which it is a constituent.

2. How is Hydrogen Dioxide prepared? What is its most striking property?

3. If you wished to obtain 100 litres of Oxygen gas how many grains of Potassium Chlorate would you employ?

4. What takes place when Nitric Acid and Caustic Soda are brought together? Write the equation.

5. What do you understand by Allotropism? Give several examples.

6. How would you prepare Carbon Monoxide? What are its properties? Why is it called a reducing agent?

7. What elements constitute the Chlorine Family? Describe briefly the preparation and properties of one member of the family.

8. How is Hydrogen Sulphide prepared? What are its properties? What its principal use?

9. Write equations illustrating the changes that take place (*a*) when Calcium Carbonate is dissolved in Hydrochloric Acid, and (*b*) when Ammonium Nitrate is heated.

10. What reagents would you employ if you wished to dissolve each of the following substances : Copper, Zinc, Gold, Sulphur, Iodine ?

PHYSICS.

TUESDAY, SEPTEMBER 17th :—AFTERNOON, 2 TO 3.30.

1. What is meant by the "law of gravitation" ? Does a given mass of substance weigh the same at all points of the earth's surface ?

2. State Boyle' Law.

A long U shaped glass tube is filled with mercury to a certain height and one end is then closed. Mercury is then poured in the other limb until the volume of the air is changed from 15 to 10 inches of the tube. Find the difference in level between the mercury in the two tubes, give the height if the mercury barometer is 30 inches.

3. Define the specific gravity of a substance. Explain the method of finding the specific gravity of a solid that floats in water.

A solid lighter than water and weighing 20 gr. in air is fastened to a piece of metal and both together weigh 32 gr. in water. Find the specific gravity of the light solid, given the piece of metal weighs 40 gr. in water.

4. What is meant by the "acceleration due to gravity."

A canon ball, fired horizontally from the deck of a ship 20 feet above the water, strikes a floating target 2,300 ft. away. Find the velocity of the shot.

5. Explain with examples what is meant by potential and kinetic energy.

6. Explain clearly how you would construct and graduate a mercury thermometer. Reduce 100°F. to the centigrade scale.

7. What is meant by the "dew point" and how is it determined ? Explain why the air in a Canadian winter is dry.

8. What is meant by the "boiling point" of a liquid ? What is the effect of pressure on the boiling point ? Illustrate your answer with experiments.

FIRST YEAR EXHIBITIONS.

FACULTY OF ARTS

FIRST YEAR EXHIBITIONS.

GREEK TRANSLATION AT SIGHT.

WEDNESDAY, SEPTEMBER 18TH :—MORNING 9 TO 10.

Translate into English :

(XENOPHON, ANABASIS VI. 4. 12.)

Μετὰ δὲ ταῦτα ἀναστὰς εἶπε Ξενοφῶν, Ὦ ἄνδρες στρατιῶται, τὴν μὲν πορείαν. ὡς ἔοικε. πεζῇ ποιητέον· οὐ γὰρ ἔστι πλοῖα. ἀνάγκη δὲ πορεύεσθαι ἤδη· οὐ γὰρ ἔστι μένουσι τὰ ἐπιτήδεια. ἡμεῖς οὖν ἔφη, θυσόμεθα· ὑμᾶς δὲ δεῖ παρασκευάζεσθαι ὡς μαχουμένους εἴ ποτε καὶ ἄλλοτε· οἱ γὰρ πολέμιοι ἀνατεθαρρήκασιν. ἐκ τούτου ἐθύοντο οἱ στρατηγοί, μάντις δὲ παρῆν Ἀρηξίων Ἀρκάς· ὁ δὲ Σιλανὸς ὁ Ἀμπρακιώτης ἤδη ἀπεδεδράκει πλοῖον μισθωσάμενος ἐξ Ἡρακλείας. θυομένοις δὲ ἐπὶ τῇ ἀφόδῳ οὐκ ἐγίγνετο τὰ ἱερά. ταύτην μὲν οὖν τὴν ἡμέραν ἐπαύσαντο.

GREEK AUTHORS.

WEDNESDAY, SEPTEMBER 18TH :—MORNING 10 TO 12.

In addition to translation, notes are required on words and phrases underlined, including full parsing of nouns and verbs.

A XENOPHON, ANABASIS.

(*a*) Ἐκάλεσε δε καὶ τοὺς Μίλητον πολιορκοῦντας, καὶ τοὺς φυγάδας ἐκέλευσε σὺν αὐτῷ στρατεύεσθαι, ὑποσχόμενος αὐτοῖς, εἰ καλῶς καταπράξειεν ἐφ' ἃ ἐστρατεύετο, μὴ πρόσθεν παύσεσθαι πρὶν αὐτοὺς καταγάγοι οἴκαδε.

(β) ἔνθα δὴ μέρος τι τῆς εὐταξίας ἦν θεάσασθαι. ῥψαντες γὰρ τοὺς πορφυροῦς κάνδυς ὅπου ἔτυχεν ἑκάστηκώς, ἵεντο ὥσπερ ἄν δράμοι τις περὶ νίκης καὶ μάλα κατὰ πρανοῦς γηλόφου, ἔχοντες τούς τε πολυτελεῖς χιτῶνας καὶ τὰς ποικίλας ἀναξυρίδας, ἔνιοι δὲ καὶ στρεπτοὺς περὶ τοῖς τραχήλοις καὶ ψέλια περὶ ταῖς χερσίν· εὐθὺς δὲ σὺν τούτοις εἰσπηδήσαντες εἰς τὸν πηλὸν θᾶττον ἢ ὥς τις ἄν ᾠετο μετεώρους ἐξεκόμισαν τὰς ἁμάξας.

(γ) καὶ γὰρ ᾔδει αὐτὸν ὅτι μέσον ἔχοι τοῦ Περσικοῦ στρατεύματος. καὶ πάντες δ' οἱ τῶν βαρβάρων ἄρχοντες μέσον ἔχοντες τὸ αὑτῶν ἡγοῦνται, νομίζοντες οὕτω καὶ ἐν ἀσφαλεστάτῳ εἶναι, ἢν ᾖ ἡ ἰσχὺς αὐτῶν ἑκατέρωθεν, καὶ εἴ τι παραγγεῖλαι χρῄζοιεν, ἥμισει ἂν χρόνῳ αἰσθάνεσθαι τὸ στράτευμα.

B. HOMER, ODYSSEY XV.

(α) Ὡς ἄρα οἱ εἰπόντι ἐπέπτατο δεξιὸς ὄρνις
αἰετὸς ἀργὴν χῆνα φέρων ὀνύχεσσι πελωρον,
ἥμερον ἐξ αὐλῆς· οἱ δ' ἰύζοντες ἕποντο
ἀνέρες ἠδὲ γυναῖκες· ὁ δέ σφισιν ἐγγύθεν ἐλθὼν
δεξιὸς ἤιξε πρόσθ' ἵππων· οἱ δὲ ἰδόντες
γήθησαν, καὶ πᾶσιν ἐνὶ φρεσὶ θυμὸς ἰάνθη.
τοῖσι δὲ Νεστορίδης Πεισίστρατος ἤρχετο μύθων·
"φράζεο δὴ, Μενελαε διοτρεφὲς, ὄρχαμε λαῶν,
ἦ νῶιν τόδ' ἔφηνε θεὸς τέρας ἦε σοὶ αὐτῷ."

(β) ἀλλ' ὅτε κεν δὴ νηῦς πλείη βιότοιο γένηται,
ἀγγελίη μοι ἔπειτα θοῶς ἐς δώμαθ' ἱκέσθω·
οἴσω γὰρ καὶ χρυσὸν, ὅτις χ' ὑποχείριος ἔλθῃ
καὶ δέ κεν ἄλλ' ἐπίβαθρον ἐγὼν ἐθέλουσα γε δοίην.
παῖδα γὰρ ἀνδρὸς ἐῆος ἐνὶ μεγάροις ἀτιτάλλω,
κερδαλέον δὴ τοῖον, ἅμα τροχόωντα θύραζε·
τόν κεν ἄγοιμ' ἐπὶ νηὸς, ὁ δ' ὑμῖν μυρίον ὦνον
ἄλφοι, ὅπη περάσητε κατ' ἀλλοθρόους ἀνθρώπους."

C. (1) EURIPIDES, HECUBA—SIDGWICK SCENES.

(α) ὁ δ' εἶπεν, 'ὦ παῖ Πηλέως, πατὴρ δ' ἐμός,
' δέξαι χοάς μοι τάσδε κηληθρίους,
' νεκρῶν ἀγωγούς· ἐλθὲ δ', ὡς πίῃς μέλαν
' κόρης ἀκραιφνὲς αἷμ', ὅ σοι δωρούμεθα
' στρατός τε κἀγώ· πρευμενὴς δ' ἡμῖν γενοῦ,
' λῦσαί τε πρύμνας καὶ χαλινωτήρια
' νεῶν δὸς ἡμῖν, πρευμενοῦς τ' ἀπ' Ἰλίου
' νόστου τυχόντας πάντας ἐς πάτραν μολεῖν.'
τοσαῦτ' ἔλεξε, πᾶς τ' ἐπηύξατο στρατός.
εἶτ' ἀμφίχρυσον φάσγανον κώπης λαβὼν
ἐξεῖλκε κολεοῦ, λογάσι δ' Ἀργείων στρατοῦ
νεανίαις ἔνευσε παρθένον λαβεῖν.

(β) Ἑκάβη δὲ παιδὸς, γνοῦσα θανάσιμον μόρον,
λόγῳ με τοιῷδ' ἤγαγ', ὡς κεκρυμμένας
θήκας φράσουσα Πριαμιδῶν ἐν Ἰλίῳ
χρυσοῦ· μόνον δὲ σὺν τέκνοισί μ' εἰσάγει
δόμους, ἵν' ἄλλος μή τις εἰδείη τάδε.
ἵζω δὲ κλίνης ἐν μέσῳ κάμψας γόνυ·
πολλαὶ δὲ χειρὸς αἱ μὲν ἐξ ἀριστερᾶς,
αἱ δ' ἔνθεν, ὡς δὴ παρὰ φίλῳ, Τρώων κόραι
θάκους ἔχουσαι κερκίδ' Ἠδωνῆς χερός
ἤνυον, ὑπ' αὐγὰς τούσδε λεύσσουσαι πέπλους·
ἄλλαι δὲ κάμακα Θρῃκίαν θεώμεναι
γυμνόν μ' ἔθηκαν διπτύχου στολίσματος.

C (2) Homer, Iliad I.

(α) καὶ δή μοι γέρας αὐτὸς ἀφαιρήσεσθαι ἀπειλεῖς.
ᾧ ἔπι πόλλ' ἐμόγησα, δόσαν δέ μοι υἷες Ἀχαιῶν.
οὐ μὲν σοί ποτε ἶσον ἔχω γέρας, ὁππότ' Ἀχαιοὶ
Τρώων ἐκπέρσωσ' εὐναιόμενον πτολίεθρον·
ἀλλὰ τὸ μὲν πλεῖον πολυαΐκος πολέμοιο
χεῖρες ἐμαὶ διέπουσ'· ἀτὰρ ἢν ποτε δασμὸς ἵκηται,
σοὶ τὸ γέρας πολὺ μεῖζον, ἐγὼ δ' ὀλίγον τε φίλον τε
ἔρχομ' ἔχων ἐπὶ νῆας, ἐπεί κε κάμω πολεμίζων.
νῦν δ' εἶμι Φθίηνδ', ἐπεὶ πολὺ φέρτερόν ἐστιν

οἶκαδ' ἴμεν σὺν νηυσὶ κορωνίσιν, οὐδέ σ' ὀΐω
ἐνθάδ' ἄτιμος ἐὼν ἄφενος καὶ πλοῦτον ἀφύξειν."

(β) "ἦ δὴ λοίγια ἔργα τάδ' ἔσσεται, οὐδ' ἔτ ἀνεκτά
εἰ δὴ σφὼ ἕνεκα θνητῶν ἐριδαίνετον ὧδε.
ἐν δὲ θεοῖσι κολῳὸν ἐλαύνετον· οὐδέ τι δαίτὸς
ἐσθλῆς ἔσσεται ἦδος, ἐπεὶ τὰ χερείονα νικᾷ.
μητρὶ δ' ἐγὼ παράφημι, καὶ αὐτῇ περ νοεούσῃ,
πατρὶ φίλῳ ἐπὶ ἦρα φέρειν Διί, ὄφρά μὴ αὖτε
νεικείῃσι πατὴρ, σὺν δ' ἡμῖν δαῖτα ταράξῃ.
εἴ πέρ γάρ κ' ἐθελῃσιν 'Ολύμπιος ἀστεροπητὴς
ἐξ ἑδέων στυφελιξαι· ὁ γὰρ πολὺ φέρτατός ἐστιν.
ἀλλὰ σὺ τὸν γ' ἐπέεσσι καθάπτεσθαι μαλακοῖσιν.
αὐτίκ' ἔπειθ' ἵλαος 'Ολύμπιος ἔσσεται ἡμῖν."

C (3) Homer, Iliad VI.

(α) " ὦ πέπον, ὦ Μενέλαε, τίη δὲ σὺ κήδεαι οὕτως
ἀνδρῶν ; ἦ σοὶ ἄριστα πεποίηται κατὰ οἶκον
πρὸς Τρώων. τῶν μή τις ὑπεκφύγοι αἰπὺν ὄλεθρον
χειρᾶς θ' ἡμετέρας· μηδ' ὅντινα γαστέρι μήτηρ
κοῦρον ἐόντα φέροι, μηδ' ὃς φύγοι. ἀλλ' ἅμα πάντες
'Ιλίου ἐξαπολοίατ' ἀκήδεστοι καὶ ἄφαντοι."
Ὣς εἰπὼν ἔτρεψεν ἀδελφειοῦ φρένας ἥρως
αἴσιμα παρειπών· ὁ δ' ἀπὸ ἕθεν ὤσατο χειρὶ
ἥρω' Ἄδρηστον. τὸν δὲ κρείων Ἀγαμέμνων
οὖτα κατὰ λαπάρην· ὁ δ' ἀνετράπετ', Ἀτρείδης δὲ
λὰξ ἐν στήθεσι βὰς ἐξέσπασε μείλινον ἔγχος

(β) ἤτοι γὰρ πατέρ' ἀμὸν ἀπέκτανε δῖος Ἀχιλλεύς,
ἐκ δὲ πόλιν πέρσεν Κιλίκων εὐναιετάωσαν,
Θήβην ὑψίπυλον· κατὰ δ' ἔκτανεν Ἠετίωνα,
οὐδέ μιν ἐξενάριξε, σεβάσσατο γὰρ τό γε θυμῷ,
ἀλλ ἄρα μιν κατέκηε σὺν ἔντεσι δαιδαλέοισιν
ἠδ' ἐπὶ σῆμ' ἔχεεν· περὶ δὲ πτελέας ἐφύτευσαν
νύμφαι ὀρεστιάδες, κοῦραι Διὸς αἰγιόχοιο.
οἳ δέ μοι ἑπτὰ κασίγνητοι ἔσαν ἐν μεγάροισιν,
οἱ μὲν πάντες ἰῷ κίον ἤματι Ἄϊδος εἴσω·
πάντας γὰρ κατέπεφνε ποδάρκης δῖος Ἀχιλλεὺς
βουσὶν ἐπ' εἰλιπόδεσσι καὶ ἀργεννῇς ὀΐεσσιν.

GREEK GRAMMAR, COMPOSITION, HIGHER TRANSLATION AT SIGHT AND HIGHER COMPOSITION.

WEDNESDAY, SEPTEMBER 18TH:—AFTERNOON, 2 TO 5.

A. 1. Give accusative Singular and Dative Plural of: *πατήρ*, *ναῦς*, *πᾶς* (all genders), *λεώς*, *λέων*, *χάρις*, *ἐλπίς*, *πόλις*, *πολύς* (all genders).

2. Give comparative and superlative of *πρόθυμος*, *ἐχθρός*, *εὖ*, *σώφρων*.

3. Give 3rd plural perf. ind. pass; 2nd sing. imperf. mid; 1st plur. aor. ind. act; 2nd plural fut. ind. mid.; Dat. plur. masc. aor. part. pass; perfect. inf. act; of *νικάω*, *καθίσημι*, *τρέφω*, *αἱρέω*.

3. With what cases are the following prepositions used, and with what differences of meaning: *μετά*, *ἐπί*, *πρός*, *κατά*?

B. Translate into Greek:

1. The whole army crossed the river.

2. They called together the King's own army.

3. I saw that many things had to be done by me.

4. Hearing this, the same soldiers were unwilling to obey their generals.

5. He said that they ought to guard against the Persian cavalry.

6. It is not possible to obtain supplies thence.

7. We will send messengers bearing letters to all who are still absent.

8. He made them rulers of the cities which he had captured.

C. For higher translation at sight:—

νῦν δὲ δή τί ἄν οἰόμεθα παθεῖν, Λακεδαιμονίοις μὲν καὶ τῶν ἀρχαίων συμμάχων ὑπαρχόντων, Ἀθηναίων δὲ καὶ οἳ ἐκείνοις τότε ἦσαν σύμμαχοι πάντων προσγεγενημένων, Τισσαφέρνους δὲ καὶ τῶν ἐπὶ θαλάττῃ ἄλλων βαρβάρων πάντων πολεμίων ἡμῖν ὄντων, πολεμιωτάτου δὲ αὐτοῦ τοῦ ἄνω Βασιλέως, ὃν ἤλθομεν ἀφαιρησόμενοι τὴν ἀρχὴν καὶ ἀποκτενοῦντες, εἰ δυναίμεθα; τούτων δὴ πάντων ὁμοῦ ὄντων ἔστι τις οὕτως ἄφρων ὅστις οἴεται ἂν ἡμᾶς περιγενέσθαι;

D. For Higher Greek Composition :—

1. The general ordered them to seize all whom they found encamped there.

2. Cyrus was pleased that the soldiers followed so quickly.

3. They all departed, some making use of the vessels which were there, and some mounting their chariots.

4. We will wait here, till our allies also arrive.

5. Though he found that the enemy were so many in number, he did not hesitate to attack.

6. When they knew that the hoplites had fled to the village, they thought that all in the ranks ought to march at once.

Alternative paper for those who do not offer prescribed Authors.

GREEK COMPOSITION, AND TRANSLATION AT SIGHT.

WEDNESDAY, SEPTEMBER 18TH :—MORNING, 10 TO 12.

(1) Translate into Greek :—

(a) Those who have better ships will conquer in this battle.

(b) We do not know whither we shall go afterwards.

(c) It is not easy to guard all our prisoners.

(d) He refused to give the gold to that woman.

(e) It benefits a good citizen to fight for his country.

(f) They slept with their arms in their hands.

(g) Solon, the wisest man of his time, made the best possible laws.

(h) Why should we hate those who have done us no wrong?

(2) Translate into English:—

ZENOPHON, ANABASIS, IV. 8. 4.)

Ἐνθα δὴ προσέρχεται Ξενοφῶντι τῶν πελταστῶν ἀνὴρ Ἀθήνησι φάσκων δεδουλευκέναι, λέγων ὅτι γιγνώσκοι τὴν φωνὴν τῶν ἀνθρώπων. καὶ οἶμαι, ἔφη, ἐμὴν ταύτην πατρίδα εἶναι· καὶ εἰ μή τι κωλύει ἐθέλω αὐτοῖς διαλεχθῆναι. Ἀλλ' οὐδὲν κωλύει, ἔφη, ἀλλὰ διαλέγου καὶ μάθε πρῶτον τινες ἐισίν. οἱ δ' εἶπον ἐρωτήσαντος ὅτι Μάκρωνες. Ἐρώτα τοίνυν, ἔφη, αὐτοὺς τί χρῄζουσιν ἡμῖν πολέμιοι εἶναι. οἱ δ' ἀπεκρίναντο Ὅτι καὶ ὑμεῖς ἐπὶ τὴν ἡμετέραν χώραν ἔρχεσθε.

LATIN.

WEDNESDAY, SEPTEMBER 11TH:—MORNING, 9 TO 12

I. TRANSLATION FROM PRESCRIBED AUTHORS.

Candidates will do any two of Sections A, B and C; D or E; and F or G.

A. CAESAR, BK. I.

Dum haec in colloquio geruntur, Caesari nuntiatum est equites Ariovisti propius tumulum accedere et ad nostros adequitare, lapides telaque in nostros conicere. Caesar loquendi finem facit, seque ad suos recepit suisque imperavit ne quod omnino telum in hostes reicerent. Nam etsi sine ullo periculo legionis delectae cum equitatu proelium fore videbat, tamen committendum non putabat ut pulsis hostibus dici posset eos ab se per fidem in colloquio circumventos. Posteaquam in vulgus militum elatum est, qua arrogantia in colloquio Ariovistus usus omni Gallia Romanis interdixisset, impetumque in nostros eius equites fecissent, eaque res colloquium ut diremisset, multo maior alacritas studiumque pugnandi maius exercitui iniectum est.

Account for the case, or mood and tense, of the following: *geruntur, tumulum, reicerent, videbat, committendum, elatum est, arrogantia, omni Gallia, Romanis, exercitui.*

B. CAESAR, BK. II.

Ubi vero moveri et appropinquare moenibus viderunt, nova atque inusitata specie commoti legatos ad Caesarem de pace miserunt, qui ad hunc modum locuti: Non existimare Romanos sine ope divina bellum gerere, qui tantae altitudinis machinationes tanta celeritate promovere et ex propinquitate pugnare possent, se suaque omnia eorum potestati permittere dixerunt. Unum petere ac deprecari: si forte pro sua clementia

ac mansuetudine, quam ipsi ab aliis audirent, statuisset Aduatucos esse conservandos, ne se armis despoliaret. Sibi omnes fere finitimos esse inimicos ac suae virtuti invidere, a quibus se defendere traditis armis non possent. Sibi praestare, si in eum casum deducerentur, quamvis fortunam a populo Romano pati quam ab his per cruciatum interfici inter quos dominari consuessent.

Account for the construction of *moenibus, locuti, altitudinis, audirent, despoliaret, virtuti, armis, deducerentur, pati, consuessct.*

C. Caesar, Bk. III.

Quo proelio bellum Venetorum totiusque orae maritimae confectum est. Nam cum omnis iuventus, omnes etiam gravioris aetatis, in quibus aliquid consilii aut dignitatis fuit, eo convenerant, tum navium quod ubique fuerat in unum locum coegerant; quibus amissis reliqui neque quo se reciperent neque quemadmodum oppida defenderent habebant. Itaque se suaque omnia Caesari dediderunt. In quos eo gravius Caesar vindicandum statuit, quo diligentius in reliquum tempus a barbaris ius legatorum conservaretur. Itaque omni senatu necato reliquos sub corona vendidit.

Account for the case, or mood and tense, of the following words: *proelio, aetatis, consilii, reciperent, defenderent, eo, navium, vindicandum, conservaretur, necato.*

D. Virgil, Bk. I.

Haec dum Dardanio Aeneae miranda videntur,
dum stupet, obtutuque haeret defixus in uno,
regina ad templum, forma pulcherrima Dido,
incessit, magna iuvenum stipante caterva.
Qualis in Eurotae ripis, aut per iuga Cynthi
exercet Diana choros, quam mille secutae
hinc atque hinc glomerantur Oreades: illa pharetram
fert humero, gradiensque deas supereminet omnes;
Latonae tacitum pertentant gaudia pectus:
talis erat Dido, talem se laeta ferebat
per medios, instans operi regnisque futuris.

(*a*) Scan the first two lines.

(*b*) Write a brief note on the following words or phrases: *Tyrrhenum aequor, Syrtes, Cerealia arma, Punica regna, Penates, Oenotri viri, relliquias Danaum, et vos celebrate faventes, urbem Patavi, rapti Ganymedis honores.*

E. Virgil, Bk. II.

Hic mihi nescio quod trepido male numem amicum
confusam eripuit mentem. Namque avia cursu
dum sequor, et nota excedo regione viarum,
heu! misero coniunx fatone erepta Creüsa
substitit, erravitne via, seu lassa resedit,
incertum; nec post oculis est reddita nostris.

Nec prius amissam respexi, animumve reflexi,
quam tumulum antiquæ Cereris sedemque sacratam
venimus. Hic demum, collectis omnibus, una
defuit, et comites, natumque, virumque fefellit.

(*a*) Scan the third and fourth lines.

(*b*) Write a brief note on the following words or phrases: *Tenedos, donum exitiale Minervae, Palladium, intonuit laevum, Tritonia, Sigea freta, Erinys, gemini Atridae, Scyria pubes, Lucifer.*

F. Horace, Odes, I.

1. Post ignem aetheria domo
subductum macies et nova febrium
terris incubuit cohors,
semotique prius tarda necessitas
leti corripuit gradum.
Expertus vacuum Daedalus aera
pennis non homini datis;
perrupit Acheronta Herculeus labor.

(*a*) Give the several myths alluded to in these lines.

(*b*) Scan the last line, and note any peculiarities of metre.

2. Nuper sollicitum quae mihi taedium,
nunc desiderium curaque non levis,
interfusa nitentis
vites aequora cycladas.

3. Nunc est bibendum, nunc pedé libero
pulsanda tellus, nunc Saliaribus
ornare erat dapibus, sodales.
tempus erat dapibus, sodales.

(*a*) Give the outline of the thought of the two odes from which extracts 2 and 3 are taken.

(*b*) What is the date of the composition of each of these two odes?

(*c*) Describe the metre of the last two extracts.

G. Cicero, Catiline, I, II.

Haec si tecum, ut dixi, patria loquatur, nonne impetrare debeat, etiam si vim adhibere non possit? Quid, quod tu te ipse in custodiam dedisti? quod vitandae suspicionis causa, ad M.' Lepidum te habitare velle dixisti? a quo non receptus etiam ad me venire ausus es, atque ut domi te adservarem rogasti. Cum a me quoque id reponsum tulisses, me nullo modo posse isdem parietibus tuto esse tecum, quo magno in periculo essem quod isdem moenibus contineremur, ad Q. Metellum praetorem venisti.

(*a*) Account carefully for the use of each subjunctive in this passage. (*b*) Remark on the meaning of the phrase *in custodiam dedisti*. (*c*) Give the rule of Syntax for the construction of *domi meae, parietibus*, and *moenibus*.

O fortunatam rem publicam, si quidem hanc sentinam urbis eiecerit! Uno (mehercule) Catilina exhausto, levata mihi et recreata res publica videtur. Quid enim mali aut sceleris fingi aut cogitari potest quod non ille conceperit? Nemo non modo Romae, sed ne ullo quidem in angulo totius Italiae oppressus aere alieno fuit, quem non ad hoc incredibile scelēris foedus asciverit. Atque ut eius diversa studia in dissimili ratione perspicere possitis, nemo est in ludo gladiatorio paulo ad facinus audacior qui se non intimum Catilinae esse fateatur; nemo in scaena levior et nequior, qui se non eiusdem prope sodalem fuisse commemoret.

Write brief notes on : *Carcer Tullianum, custodiae vigiliaeque, colon; municipesque, prid, kalendas Januarias, Juppiter Stator, patres conscripti, Palatium*

II. TRANSLATION AT SIGHT

Candidates for Matriculation will translate A; Candidates for Exhibitions, A and B.

A

CICERO TREBATIO.

Ego te commendare non desisto, sed quid proficiam ex te scire cupio. Spem maximam habeo in Balbo, ad quem de te diligentissime et saepissime scribo. Illud soleo mirari, non me totiens accipere tuas litteras quotiens, a Quinto mihi fratre adferantur. In Britannia nihil esse audio neque auri neque argenti. Id si ita est essedum aliquod capias suadeo et ad nos quam primum recurras. Sin autem sine Britannia tamen adsequi quod volumus possumus, perfice ut sis in familiaribus Caesaris. Multum te in eo frater adiuvabit meus, multum Balbus, sed mihi crede, tuus pudor et labor plurimum. Imperatorem habes liberalissimum aetatem opportunissimam,ut tibi unum timendum sit, ne ipse tibi defuisse videare.

B.

Olim, quas vellent esse in tutela sua,
divi legerunt arbores, quercus Iovi,
at myrtus Veneri placuit, Phoebo laurea,
pinus Cybebae, populus celsa Herculi.
Minerva admirans, quare steriles sumerent,
interrogavit. causam dixit Juppiter:
'honorem fructu ne videamur pendere.'
'at, mehercules, narrabit quod quis voluerit:
oliva nobis propter fructum est gratior'
tunc sic deorum genitor atque hominum sator:
'O nata, merito sapiens dicere omnibus
nisi utile est quod facimus, stulta est gloria.'
Nihil agere, quod non prosit, fabella admonet.

LATIN

WEDNESDAY, SEPTEMBER 11TH:—AFTERNOON, 2 TO 5.

I. LATIN GRAMMAR.

Candidates for Matriculation may omit 8, 9, 11 *amd* 12; *Candidates for Exhibitions may omit* 1, 3 and 7.

1. Decline together *magnus clamor, omne genus, vir sapiens, summa quercus, haec avis, alter pes.*

2. Give the Gender, the Ablative Singular and Genitive Plural of *navis, senex, nox, vis, animal, domus, dies.*

3. Give the Comparative and Superlative of *felix, pauper, magnificus, malus, iuvenis.*

4. Write down the Latin for *eighteen, 50th,* 1000 *men,* 2000 *men, in the year* 1882, *one epistle, two epistles.*

5. Give the principal parts of *capio, patior, gaudeo, pello, augeo, gigno sentio, posco, obliviscor, haereo.*

6. Give the 1 Per. Sing. Pres. Subj. of *eo, moneo, scribo, vereor, miror.* 3 Per. Pl. Perf. Indic. Act. of *capio, cresco, scribo, iuvo.* Pres. and Fut. Imperative Act. and Pass. of *audio.* 2 Per. Sing. Imperf. Pass. of *rego, vincio, veto, moneo*

7. Name the prepositions which govern the Ablative. Which of these is regularly placed after its case? Which occasionally?

8. Give examples in Latin of (*a*) Accus. of Limit of Motion, (*b*) Greek Accusative, (*c*) Intransitive Verbs used in the Passive, (*d*) Ethical Dative, (*e*) Appositional Genitive, (*f*) Ablative of Accompaniment, (*g*) Substantive Clause of Result, (*h*) Indirect Double Question.

9. Name the Particles which are always or regularly post-positive.

10. Mark by the usual sign all the long vowels in the following words:—*triginta, fere, bene, nolis, proficisci, quamvis, infans, diei, fieri, totius, mihi.*

11. Express in Latin the following dates: Jan. 25; Mar. 4; Sept. 10; B.C. 63.

12. (*a*) What is the difference between an English and Roman mile? (*b*) Explain the following grammatical terms:—Brachylogy, Hendiadys Pleonasm, Protasis, Zeugma.

II. LATIN PROSE COMPOSITION.

Candidates for Matriculation will do the first six only.

1. Tell me why you are afraid.

2. We were sent to ask for peace.

3. Now they were ready for braving all dangers.

4. When they attempted to cross the Rhone, Caesar set out from Rome.

5. So popular was he with the soldiers, that they gladly followed him.

6. (*To be done first in Oratio Recta, then in Oratio Obliqua.*) He said that he had ten legions ready; moreover, he had ascertained that Caesar was unpopular with the soldiers, and that they could not be persuaded to follow him. He urged that troops should be levied throughout Italy, that Sulla should be sent to Sicily, that money should be given to Pompeius to carry on the war. (Or. Rect., I have ten legions, ready, etc.)

7. They sailed from Palos, August 3. It took them a month to reach the Canary Islands; but after they had passed those, and found themselves on the lonely ocean at night, many of the sailors wept and declared they never should return. Columbus quieted them, and they sailed on day by day, sometimes hopeful, and sometimes mutinous. Once the sailors plotted to throw Columbus overboard. Often they thought they saw signs of land; once they were sure of it, and it proved only a cloud. Finally one evening at ten o'clock Columbus saw a light glimmering across the water, and the next morning from one of the smaller vessels was heard the signal agreed upon for "making land."

ADDITIONAL PAPER IN TRANSLATION AT SIGHT AND LATIN COMPOSITION.

(*This paper is intended for those who do not offer the prescribed books*).

WEDNESDAY, SEPTEMBER 11TH :—MORNING, 9 TO 11.

1. Translate into Latin :—

As the Etruscans approached, they took the hill Janiculum and drove the Romans back over the wooden bridge into the city. Then the Romans were seized with great fear ; and they did not venture to oppose the enemy, and to defend the entrance of the bridge but they fled across the bridge into the city. When Horatius, who was surnamed Cocles, saw this, he placed himself opposite to the enemy at the entrance of this bridge, and two warriors, who were called Larcius and Herminius Stayed with him. These three men stirred not from the place, but fought alone with the whole army of the Etruscans, and held their position while the Romans pulled down the bridge behind them.

2. Translate into English :—

A.

DE NOVO GENERE INTERITUS CROTONIENSIS MILONIS.

Milo Crotoniensis, athleta inlustris, quem in chronicis scriptum est Olympiade LXII. primum coronatum esse, exitum habuit e vita miserandum et mirandum cum iam natu grandis artem athleticam desisset iterque fac ret forte solus in locis Italiae silvestribus, quercum vidit proxime viam patulis in parte media rimis hiantem. Tum experiri, credo, etiam tunc volens, an ullae sibi reliquae vires adessent, inmissis in cavernas arborio digitis, diducere et rescindere quercum conatus est. Ac mediam quidem partem discidit divellitque ; quercus autem in duas, diducta partes, cum ille, quasi perfecto quod erat conixus, manus taxasset, cassant vi rediit in naturam, manibusque eius retentis inclusisque stricta denuo et cohaesa, dilacerandum hominem feris praebuit.

B.

Omnia, quae sensu volvuntur vota diurno,
Pectore sopito reddit amica quies ·
Venator defessa toro cum membra reponit,
Mens tamen ad silvas et sua lustra redit,
Iudicibus lites aurigae somnia currus,
Vanaque nocturnis meta cavetur equis.
Furto gaudet amans : permutat navita merces :
Et vigil elapsas quaerit avarus opes.
Blandaque largitur frustra sitientibus aegris
Irriguus gelido pocula fonte sopor.
Me quoque Musarum studium sub nocte silenti
Artibus assuetis sollicitare solet.

MATHEMATICS, PART I.

GEOMETRY.

THURSDAY, SEPTEMBER 12TH.—MORNING, 9 TO 12.

1. If a side of a triangle be produced, then the exterior angle shall be equal to the two interior opposite angles; also the three interior angles of a triangle are together equal to two right angles.

(*a*) All the interior angles of any rectilineal figure, together with fous right angles, are equal to twice as many right angles as the figure ha sides.

2. Triangles upon the same base and between the same parallels are equal in area.

3. If a straight line be divided equally and also unequally, the rectangle contained by the unequal parts, together with the square on the line between the points of section, is equal to the square on half the line.

4. Describe a square that shall be equal to a given rectilineal figure.

5. The sum of the squares on the sides of a parallelogram is equal to the sum of the square on the diagonals.

6. In a right angled triangle, if a perpendicular be drawn from the right angle to the hypotenuse the square on the perpendicular is equal to the rectangle contained by the segments of the hypotenuse.

7. Equal chords in a circle are equidistant from the centre.

(*a*) Find the locus of the middle points of equal chords in a circle.

8. The opposite angles of a quadrilateral inscribed in a circle are together equal to two right angles.

9. If two chords of a circle cut one another, the rectangle contained by the segments of the one shall be equal to the rectangle contained by the segments of the other.

MATHEMATICS, PART I.

ALGEBRA AND ARITHMETIC.

THURSDAY, SEPTEMBER 12TH:—AFTERNOON, 2 TO 5.

1. Simplify (*a*) $\frac{a+x}{a^2+ax+x^2} + \frac{a-x}{a^2-ax+x^2} + \frac{2x^3}{a^4+a^2x^2+x^4}$

(*b*) $(1+x)^2 \div \left\{1 + \frac{x}{1-x+\frac{x}{1\ x+x^2}}\right\}$

2. Resolve into factors :

(1) $x^2 - 20\,xy + 96\,y^2$.

(2) $a^4 + 7a^2 - 98$.

(3) $2\,mn + m^2 + n^2 - 1$.

(4) $x^8 - \frac{1}{256}$.

3. Solve the following equations :

(1) $\frac{x+4}{14} + \frac{x-4}{6} = 2$,

(2) $\begin{cases} \frac{2}{5}\,x - \frac{1}{12}\,y = 3, \\ 4\,x - y = 20. \end{cases}$

(3) $22\,x + 23 - x^2 = 0$.

4. Two persons, 27 miles apart, setting out at the same time are together in 9 hours if they walk in the same direction, but in 3 hours if they walk in opposite directions. Find their rates of walking.

5. Solve the following equations

(1) $\frac{6x+8}{2x+1} - \frac{2x+38}{x+12} = 1$

(2) $\frac{5}{x-2} - \frac{4}{x} = \frac{3}{x+6}$

(3) $\begin{cases} x^3 - y^3 = 127 \\ x^2y - xy^2 = 42 \end{cases}$

6. The perimeter of one square exceeds that of another by 100 feet ; and the area of the larger square exceeds three times the area of the smaller by 325 square feet: find the length of the sides.

7. Prove (1) $a^\circ = 1$

(2) $a^m \times a^n = a^{m+n}$

(3) $a^{\frac{m}{n}} = \sqrt[n]{a^m}$.

Rationalize the denominator of

$$\frac{\sqrt{6} - 2\sqrt{7}}{3\sqrt{6} + 2\sqrt{7}}$$

8. A merchant who sold goods at an average profit of 12 p c. made a profit of $2,814 in a year. What was the amount of his sales.

9. The floor of an assembly hall is 70 feet long and 55 feet wide. How long will the line be that will divide it into two right-angled triangles.

10. Find the difference between the simple and compound interest on $1,500 for 5 years at 6 p.c.

11. Find the area of the floor of question 9 in square metres.

MATHEMATICS, *PART II.*

TUESDAY, SEPT. 17TH:—MORNING, 9 TO 12.30.

GEOMETRY.

1. (1) Inscribe a circle in a given triangle.
(2) Inscribe a circle in a quadrant of a circle of radius a.
(3) Show that the radius of the circle required in (2) is $(\sqrt{2} - 1)\ a$.

2. Describe a circle about a given regular pentagon.

3. (1) Find a third proportional to two given straight lines.
(2) OA is a tangent to a circle, OB a line which meets the circle in B and C. Show that OC is a third proportional to OB and OA.

4. In a right-angled triangle any rectilineal figure described on the hypotenuse is equal to the sum of the similar and similarly described figures on the sides.

ALGEBRA.

5. What are duplicate ratio and subduplicate ratio? If the subduplicate ratio of $P - x : Q - x$ be $P : Q$, prove that $x = \dfrac{PQ}{P+Q}$

6. Give the definitions of the three progressions, and find the arithmetic, geometric, and harmonic means between a and b. Why is the geometric mean of a and b, also the geometric mean of the other means?

7. (1) Find the number of combinations of n distinct things taken r at a time.
(2) Show that ${}^{n}C_{r} + {}^{n}C_{r-1} = {}^{n+1}C_{r}$

8. (1) How many words can be formed by using all the letters of the word *edible*?
(2) How many of these words begin and end with e?
(3) How many neither begin nor end with e?

9. Find the third term of $(1 + 2x)^{\frac{11}{2}}$.

TRIGONOMETRY.

10. What units are commonly employed in the measurementlar angles? Find the number of degrees in a radian (unit of circu of measure).

11. Express the cosines of $90° + A$, $180° + A$, and $270° + A$ in terms of the ratios of A.

12. Prove that
(1) $\sin (A - B) = \sin A \cos B - \cos A \sin B$,
(2) $\sin A + \sin B = 2 \sin \dfrac{A+B}{2} \cos \dfrac{A-B}{2}$.

13. Solve the following equations for angles less than 180°:—

(1) $\tan x + \cot x = 2$,

(2) $\cos^2 x + 2 \sin x = \frac{7}{4}$.

14. Show that

(1) $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$,

(2) $\tan^2\theta + \cot^2\theta = \sec^2\theta \operatorname{cosec}^2\theta - 2$,

(3) $\frac{1 - \cos\theta}{\sin\theta} = \frac{\sin\theta}{1 + \cos\theta} = \tan\frac{\theta}{2}$,

(4) $\frac{\cos 9° + \sin 9°}{\cos 9° - \sin 9°} = \tan 54°$.

ENGLISH GRAMMAR.

FRIDAY SEPTEMBER 13TH :—MORNING, 9 TO 12.

(*Candidates will answer questions* 1, 2, 4, 5, 6 7, 9 *of the Matriculation Paper and also the following*) :

10. Account for the italicized letters in the following words : were, might, deem, could, number, estate, yclept, bench, day, foremost.

11. Compare the present and past tenses (indefinite) of an Anglo-Saxon verb, both weak and strong, with their modern English forms.

12. Examine historically every word in the following sentences : All the men went to the houses and found room to sit. They remained there idle.

ENGLISH LITERATURE.

MILTON—*L'Allegro and other Poems.*

FRIDAY, SEPTEMBER 13TH :—AFTERNOON, 2 TO 6.

(*Candidates will take the Matriculation Paper and also the following.*)

1. (*a*) Give the chief divisions of L'Allegro and Il Penseroso.

(*b*) Give the meaning of the following words, and state with precision where each is found, *buxom, unreproved, secure, lubber, bout, grain, accusutomed, virtuous, brown, garish.*

2. Notice the construction of Arcades. What elements of the masque are to be found in Arcades ? Illustrate.

3. Is Lycidas a pastoral poem ? How much biograghy do you find in it ? Name the speakers (other than the poet) in the poem, and give the substances of what they say.

4. What important views of Milton are revealed in his sonnets ?

5. Quote two passages of about six lines in length which you think impressive, and say where they are found.

ENGLISH LITERATURE.

SATURDAY, SEPT. 21ST:—MORNING, 9 TO 11.

MORLEY, *First Sketch*, CHAPS. VII. AND VIII.

1. With what literary works are the following names connected? John Fox, Thomas Sackville, Matthew Parker, John Lyly, Stephen Gosson, Sir Humphrey Gilbert, George Chapman, Michael Dratyon, Joseph Hall, William Camden.

2. Sketch the progress of the Elizabethan drama up to the beginning of Shakspere's career, giving the names of the leading playwrights and their principal works.

3. Indicate very briefly the character or purport of the following, aad give the names of the authors: "Tetrachordon," "The Comedy of Errors," "An Admonition to the People of England," "The Laws of Ecclesiastical Polity," "The Knight of the Burning Pestle," "Prosof popoia," "Sejanus," "Instauratio Magna," "Colin Clout's Come Home Again," "Every Man in His Humour."

4. Write a short life of Milton up to 1649, mentioning his chief works in chronological order.

MACAULAY'S ESSAYS.

TUESDAY, SEPTEMBER 17TH:—AFTERNOON, 2 TO 4.

1. (*a*) What account does Macaulay give of the Lutheran revolt from the Roman Church?

(*b*) Describe the Catholic revival which followed the Protestant movement.

2. By what dangers was the Roman Church threatened in the eighteenth century?

3. How does Macaulay allude to Sir Thomas More; Provence; Frederic the Second; John Wesley; Edinburgh and Florence?

4. Describe Frederic's part in the administration of Prussia.

5. Trace the course of the Seven Years' War after the battle of Rossbach.

6 How does Macaulay allude to Frederic's knowledge of Latin; the Silesian question; the battle of Molwitz: Crébillon; George Keith, Earl Marischal of Scotland.

ENGLISH COMPOSITION.

TUESDAY, SEPT. 17TH:—AFTERNOON, 4 TO 5.

Write an essay of not less than two pages on any *one* of the following subjects:

(*a*) A short account of the Life of Milton.
(*b*) The Nature of Entertainments called Masques.
(*c*) The Character of Ulysses as presented by Tennyson.

FRENCH.

MONDAY, 16TH SEPTEMBER:—MORNING, 9 TO 12.

I. Correct the following sentences, and explain your corrections: Religion prêche charité, vertu et sagesse à tous hommes. Votre oncle est un anglais. Hiver est très rigoureux en Canada. Il vient de la France, et il veut aller à l'Angleterre.

II. Thalès est le premier, je crois, qui *ait enseigné* que l'âme est immortelle. Je doutais que vous *eussiez écrit* la semaine passée. Je cherche quelqu'un qui me *rende* ce service. Croyez-vous qu'il *vienne?* Je doute que vous *écrivissiez* cet exercice, si vous n'y étiez forcé.

Translate the above sentences, and account for the mood and tense of each verb in italics.

III. Give rules with examples for the following:—

(1) The past participles of reflective verbs; (2) the past participles of impersonal verbs; (3) the past participle conjugated with *avoir*; (4) the past participle preceded by *en*.

IV. Point out the different meanings or uses of:—

(1) *Si* and *oui*, (2) *plus de* and *plus que*, (3) *plus* and *davantage*, (4) *plus tôt* and *plutôt*, (5) *en* and *dans*, (6) *avant*, *devant* and *auparavant*.

V. Translate and explain grammatical or syntactical peculiarities in the following:—

(*a*) Those children were bare-headed.

(*b*) He received a letter postage paid every week.

(*c*) Do you want a new book?

(*d*) My brother is a small man.

(*e*) My mother is useful to and beloved by this family.

(*f*) I have cut my finger.

(*g*) I read a story in the book of that author which interests me very much.

VI. Translate:

(1) A tulip and a rose were neighbors in the same garden. They were both exceedingly beautiful, yet the gardener paid more care and more attention to the rose. The tulip vain of her exterior charms, and not being able to bear the thought of being abandoned for another, reproached the gardener with his partiality. "Why is my beauty thus neglected?" she asked him. "Are not my colours more brilliant, more variegated and more attractive than those of the rose? Why then do you prefer her to me, and bestow on her all your affection?" "Do not be discontented, beautiful tulip," answered the gardener; "I know your beauties, and I admire them as they deserve; but there are in my favorite rose odors and nternal charms which beauty alone cannot afford me."

External beauty strikes at first sight, but we should prefer internal merit.

(2) When Boabdil, the last king of Grenada, was obliged to abandon the kingdom of his fathers, he stopped on the summit of Mount Padul. From this high place was discovered the sea where the unfortunate mon-

arch was about to embark for Africa ; also Grenada and the Xenil, on the border of which the tents of Ferdinand and Isabella arose, were seen. At the sight of this beautiful country and the cypresses that yet marked here and there the tombs of the Mussulmans, Boabdil began to shed tears. The sultana Aïxa, his mother, who accompanied him in his exile, together with the lords that once composed his court, said to him : "Weep now as a woman for a kingdom, which thou couldst not defend as a man.."—They descended the mountain, and Grenada disappeared from their eyes forever.

LUNDI, 16 SEPTEMBRE, 1901 :—APRÈS-MIDI, DE 2 À 5 HEURES.

N.B.—Questions expressed in French are to be answered in French.

I. Translate :—

(1) Le marquis : Belle aubaine que son dévouement! Un mari qui ne fera que la chasse aux papillons, qui passera sa vie à chercher dans l'herbe des bêtes à bon Dieu ! qui, le soir, pour se distraire, montera des oiseaux ou empaillera des lézards !— Tiens, ma fille, il est triste de voir un gentilhomme occuper sa jeunesse à de pareilles niaiseries. Regarde Bernard, ça n'a pas encore vingt-huit ans ; eh bien ! ça vous a déjà un bout de ruban à la boutonnière ; ça s'est promené en vainqueur dans les capitales de l'Europe ; ça s'est fait tuer à la bataille de ..... enfin, n'importe! Je suis obligé de l'avouer, je mourrais plus tranquille si je te laissais appuyée sur le bras de ce jeune guerrier.

(*Mlle. de la Seiglière.*)

(2) Le public n'accorde sa confiance qu'aux mensonges vraisemblables. Allez donc persuader aux badauds de Paris, de Londres ou de Berlin que vous avez vu un capitaine de gendarmerie embrasser un chef de brigands! Une compagnie de troupes d'élite faire sentinelle autour des prisonniers d'Hadgi-Stavros, pour lui donner le temps de piller la caisse de l'armée! Les plus hauts fonctionnaires de l'Etat fonder une compagnie par actions pour détrousser les voyageurs ! Autant vaudrait leur raconter que les souris de l'Afrique ont fait alliance avec les chats, et que nos agneaux vont chercher leur nourriture dans la gueule des loups. Savez-vous ce qui nous protège contre les mécontentements de l'Europe ? C'est l'invraisemblance de notre civilisation. Heureusement pour le royaume, tout ce qu'on écrira de vrai contre nous sera toujours trop violent pour être cru. Je pourrais vous citer un petit livre qui n'est pas à notre louange, quoiqu'il soit exact d'un bout à l'autre.

(*Le Roi des Montagnes.*)

II. Raconter l'aventure à laquelle I. (2) fait allusion.

III. Dites ce que vous savez sur (1) Bernard dans Mlle. de la Seiglière, (2) la physionomie de Paris pendant le siège.

IV. Give English equivalents for the following expressions :

Vous me la donnez belle ; j'en apprends de belles sur votre compte ; à brûle-pourpoint ; donner un coup de main ; avoir beau faire ; au plus juste Prix ; à la bonne heure ; il ne manquerait plus que cela ; payer de sa personne ; qu'à cela ne tienne ; je n'en reviens pas ; être en mesure de ; Pot au feu ; faire pendant à ; passer par les armes.

GERMAN.

MONDAY, SEPT. 16TH :—MORNING, 9 TO 12.

1. Translate the extracts taken from any three of the following Authors :—

1 (*a*) Euch zu verteid'gen, eure holde Unschuld
Zu schützen vor der Rache des Tyrannen,
Will er zum Morde jetzt den Bogen spannen.
Ich laure auf ein edles Wild—Läßt sich's
Der Jäger nicht verdrießen, Tage lang
Umher zu streifen in des Winters Strenge,
Von Fels zu Fels den Wagesprung zu thun,
Hinan zu klimmen an den glatten Wänden,
Wo er sich anleimt mit dem eignen Blut,
— Um ein armselig Grattier zu erjagen.
Hier gilt es einen köstlicheren Preis,
Das Herz des Todfeinds, der mich will verderben.

(*b*) Sie folgten, wenn der Heribann erging,
Dem Reichspanier und schlugen seine Schlachten,
Nach Welschland zogen sie gewappnet mit,
Die Römerkron' ihm auf das Haupt zu setzen.
Daheim regierten sie sich fröhlich selbst
Nach altem Brauch und eigenem Gesetz ;
Der höchste Blutbann war allein des Kaisers.
Und dazu ward bestellt ein großer Graf,
Der hatte seinen Sitz nicht in dem Lande.

SCHILLER.

2. (*a*) Jetzt habe ich den Vorteil, lachte er dabei vor sich hin, dasz ich gar nicht weisz, wohin ich komme. Hier steht kein langweiliger Wegweiser, der einem immer schon Stunden vorher sagt, wie der nächste Ort heiszt, und dann jedesmal mit der Entfernung Unrecht hat. Wie die Leute hier nur ihre Stunden messen, möcht' ich wissen! Merkwürdig still ist's aber hier im Grunde,—freilich, am Sonntage haben die Bauern drauszen Nichts zu thun, und wenn sie die ganze Woche hinter ihrem Pfluge oder neben dem Wagen herlaufen müssen, halten sie am Sonntage nicht viel vom Spazierengehen, schlafen sich Morgens tüchtig aus und strecken die Beine dann nach dem Mittagsessen unter den Wirtstisch.

(*b*) Jetzt endlich hatten sie die äuszersten Häuser erreicht, und so lebendig es im Dorfe selber auch gewesen, so still und einsam, ja so totenähnlich wurde es hier. . In den We-

gen wuchs Gras, und merkwürdig schien es besonders den jungen Fremden, dasz kein einziger Obstbaum auch nur *eine* Frucht trug.

GERSTAECKER.

3. So dämmerte der Tag heran, an welchem Boleslavs Schicksal sich entscheiden sollte. Es war ein klarer sonniger Frosttag. Glitzernder Rohrreif lag auf dem Gezweig, und über die weiszen Schneeflächen glitt ein müder Purpurschein.

Den Vormittag brachte er beim Ordnen der Papiere zu. Was irgend kompromittierend für das Andenken des Vaters war, sollte vernichtet werden, denn es war anzunehmen, dasz, wenn man ihn heut' in Verhaft nahm, morgen bereits fremde Hände in diesen Stöszen wühlen würden.

Schon hielt er die Briefe in der Hand, um sie dem Ofenfeuer anzuvertrauen, da besann er sich eines Besseren. Wenn es ihm ernst damit war, des Vaters Schuld auf sich zu nehmen, durfte er nichts vertuschen, nichts verheimlichen und seine Bürde nicht leichter machen! Die Wahrheit zu fälschen, war seiner nicht wert. Lieber in Schanden zu Grunde gehen, als Leben und Ehren auf Lügen erbauen.

SUDERMANN.

4. Es war ein beschwerlicher Weg; denn sie sank bald bis über die Knöchel ein, der Wind peitschte ihr das Haar um die Schultern, dasz sie stehen bleiben muszte, um es in einen groszen Knoten zusammen zu schürzen, und der Regen lief ihr über die Wangen. Aber der Sumpf wurde immer tiefer, und die blauen Flämmchen, welche in immer gröszerer Zahl an allen Orten hervorstiegen, schienen sie äffen zu wollen. Denn wenn es eine Zeit lang den Anschein gehabt, als wenn sie still ständen oder gar ihr entgegenkämen, so dasz sie schon hoffte, sie bald zu erreichen, so schwebten sie doch bald wieder bis zur Mitte des Sumpfes zurück, oder verloschten plötzlich, um an einer entfernteren Stelle wieder aufzusteigen. . . Da hörte das Unwetter auf, die schmale Mondsichel trat zwischen den Wolken heraus, und vor ihr inmitten einer groszen dunkeln Lache erhob sich das bezauberte Schlosz der Irrwischkönigin.

LEANDER.

5. "Bei solcher Unterhaltung käme mir kein Schlaf in die Augen, wenn ich auch zwei, drei und mehrere Nächte wach bleiben müszte," sagte der Zirkelschmied, als der Jäger geendet hatte. "Und oft schon habe ich dies bewährt gefunden. So war ich in früherer Zeit als Geselle bei einem Glockengieszer,

Der Meister war ein reicher Mann und kein Geizhals. Aber eben darum wunderten wir uns nicht wenig, als wir einmal eine grosze Arbeit hatten, und er, ganz gegen seine Gewohnheit, so knickerig als möglich erschien. Es wurde für die neue Kirche eine Glocke gegossen. Wir glaubten nicht anders, als der Meister werde sein Mutterfäszchen anstecken und uns den besten Wein vorsetzen. Aber nicht also. Er liesz nur alle Stunden einen Umtrunk thun und fing an von seiner Wanderschaft zu erzählen, dann kam es an den Obergesellen, und so nach der Reihe, und Keiner von uns wurde schläfrig, denn begierig horchten wir Alle zu. Ehe wir uns dessen versahen, war es Tag. Da erkannten wir die List des Meisters, dasz er uns durch Reden habe wach halten wollen. Denn als die Glocke fertig war, schonte er seinen Wein nicht und holte ein, was er weislich in jener Nacht versäumt hatte."

—HAUFF.

6. (*a*) Die Frau Kanzleirätin Engelmann war, das sagte die ganze Stadt, eine sehr gebildete Dame. Als beim letzten Vogelschießen eine französische Seiltänzertruppe in Hackelburg Vorstellungen gab, hatte ein Dutzend glaubwürdiger Personen mit eigenen Ohren gehört, wie sie an der Kasse „quatre billets" verlangt hatte, auch hatte sie auf die Groschenbibliothek der deutschen Klassiker subskribiert und lächelte überlegen, wenn man Macbeth, Shylock und Leicester statt Meebeth, Scheilock und Lester sagte. Unter solchen Umständen ist es selbstverständlich, daß bei der Ausbildung ihrer Tochter nichts gespart worden war. Marie besaß jene anspruchslose Bildung, welche ein Mädchen ebenso weit über die Genfer Pensionspflanze als über das kartoffelschälende Ideal eines Philisters erhebt.

BAUMBACH.

II. Translate (at sight):—

1. One very cold evening a traveller arrived at an inn. All the places round the fire were occupied and no one of the guests seemed willing to give up his place to him. The traveller therefore called the hostler (Knecht) and ordered him to give his horse two dozen oysters "Oysters!" said the hostler, "but surely a horse does not eat oysters. "Do what I tell you," replied the traveller; "you will no doubt see." The hostler went to the stable to give the horse the oysters, and all the guests now left their places to see the horse eat oysters. Meanwhile the traveller took possession of the best place by the fire. Soon after

the hostler came in again and said the horse would not eat any oysters. "That's true, no doubt," said the traveller, "then bring me the oysters, and give the horse some oats."

2. Alfred the Great was only twenty-three years old when he became king. Twice in his childhood he had been in Rome and once he had been for some time in Paris. Learning, however, was so rare in those times that, when he was twelve years old, he had not yet learned to read. But, like many other great and good men, he had an excellent mother; and one day it happened that this lady, whose name was Osburga, as she was sitting among her sons, read a book which contained Saxon poems. The book was written by hand, and the first letter of every verse was large and beautifully painted. As the boys admired the book very much, their mother said she would give it to the one who first learned to read. Alfred sought out a teacher the same day and began to learn with great industry and soon won the book. He was proud of it all his life.

SECOND YEAR EXHIBITIONS.

FACULTY OF ARTS.

SECOND YEAR EXHIBITIONS
FACULTY OF ARTS

SECOND YEAR EXHIBITIONS.

GREEK AUTHORS.

WEDNESDAY. SEPTEMBER 18TH, MORNING 10 TO 12,

Translate with notes on words and phrases underlined :

1) LUCIAN, SOMNIUM AND CHARON.

(*a*) ἀφεὶς δὲ αὐτοὺς τηλικούτους καὶ τοιούτους ἄνδρας καὶ πράξεις λαμπρὰς καὶ λόγους σεμνούς καὶ σχῆμα εὐπρεπὲς καὶ τιμὴν καὶ δόξαν καὶ ἔπαινον καὶ προεδρίας καὶ δύναμιν καὶ ἀρχὰς καὶ τὸ ἐπὶ λόγοις εὐδοκιμεῖν καὶ τὸ ἐπὶ συνέσει εὐδαιμονίζεσθαι χιτώνιόν τι πιναρὸν ἐνδύσῃ καὶ σχῆμα δουλοπρεπὲς ἀναλήψῃ καὶ μοχλία καὶ γλυφεῖα καὶ κοπέας καὶ κολαπτῆρας ἐν ταῖν χεροῖν ἕξεις κάτω νενευκὼς ἐς τὸ ἔργον, χαμαιπετὴς καὶ χαμαίζηλος καὶ πάντα τρόπον ταπεινός, ἀνακύπτων δὲ οὐδέποτε οὐδὲ ἐλεύθερον οὐδὲν ἐπινοῶν, ἀλλὰ τὰ μὲν ἔργα ὅπως εὔρυθμα καὶ εὐσχήμονα ἔσται σοι προνοῶν, ὅπως δὲ αὐτὸς εὔρυθμος καὶ κόσμιος ἔσῃ ἥκιστα πεφροντικώς, ἀλλ' ἀτιμότερον ποιῶν σεαυτὸν λίθων.

(*b*) ΧΑΡ. καὶ πόσῳ δικαιότερον ἐμὲ ἄν, ὦ Ἑρμῆ, ἐπαινοῖεν, ὃς αὐτόν σοι τὸν Μίλωνα μετ' ὀλίγον συλλαβὼν ἐνθήσομαι ἐς τὸ σκαφίδιον, ὁπόταν ἥκῃ πρὸς ἡμᾶς ὑπὸ τοῦ ἀμαχωτάτου τῶν ἀνταγωνιστῶν καταπαλαισθεὶς τοῦ θανάτου, μηδὲ συνεὶς ὅπως αὐτὸν ὑποσκελίζει ; κᾆτα οἰμώξεται ἡμῖν δηλαδὴ μεμνημένος τῶν στεφάνων τούτων καὶ τοῦ κρότου· νῦν δὲ μέγα φρονεῖ θαυμαζόμενος ἐπὶ τῇ τοῦ ταύρου φορᾷ. τί οὖν οἰηθῶμεν ; ἆρα ἐλπιζειν αὐτὸν καὶ τεθνήξεσθαί ποτε ;

(*c*) ἦ τί γὰρ οὐκ ἂν ποιήσειεν ἐκεῖνος ὁ τὴν οἰκίαν σπουδῇ οἰκοδομούμενος καὶ τοὺς ἐργάτας ἐπισπέρχων, εἰ μάθοι ὅτι ἡ μὲν ἕξει τέλος αὐτῷ, ὁ δὲ ἄρτι ἐπιθεὶς τὸν ὄροφον ἄπεισι τῷ κληρονόμῳ καταλιπὼν ἀπολαύειν αὐτῆς, αὐτὸς μηδὲ δειπνήσας ἄθλιος ἐν αὐτῇ ; ἐκεῖνος μὲν γὰρ ὁ χαίρων ὅτι ἄρρεν παῖδα τέτοκεν αὐτῷ ἡ γυνή, καὶ τοὺς φίλους διὰ

τοῦτο ἐστιῶν καὶ τοὔνομα τοῦ πατρὸς τιθέμενος, εἰ ἠπίστατο ὡς ἑπτέτης γενόμενος ὁ παῖς τεθνήξεται, ἆρ' ἄν σοι δοκεῖ χαίρειν ἐπ' αὐτῷ γεννωμένῳ;

(2) DEMOSTHENES, OLYNTHIACS. I. II.

(*a*) εἴτε γὰρ, ὑμῶν τὴν ἐκείνου κακῶς ποιούντων, ὑπομείνας τοῦτ', Ὄλυνθον παραστήσεται, ῥᾳδίως ἐπὶ τὴν οἰκείαν ἐλθὼν ἀμυνεῖται· εἴτε, βοηθησάντων μόνον ὑμῶν εἰς Ὄλυνθον, ἀκινδύνως ὁρῶν ἔχοντα τὰ οἴκοι, προσκαθεδεῖται καὶ προσεδρεύσει τοῖς πράγμασι, περιέσται τῷ χρόνῳ τῶν πολιορκουμένων.

(*b*) Τὸ μὲν οὖν ἐπίορκον κἄπιστον καλεῖν, ἄνευ τοῦ τὰ πεπραγμένα δεικνύναι, λοιδορίαν εἶναί τις ἂν φήσειε κενὴν δικαίως· τὸ δὲ πάνθ' ὅσα πώποτ' ἔπραξε διεξιόντ' ἐφ' ἅπασι τούτοις ἐλέγχειν, καὶ βραχέος λόγου συμβαίνει δεῖσθαι, καὶ δυοῖν ἕνεχ' ἡγοῦμαι συμφέρειν εἰρῆσθαι, τοῦ τ' ἐκεῖνον, ὅπερ καὶ ἀληθὲς ὑπάρχει, φαῦλον φαίνεσθαι, καὶ τοὺς ὑπερεκπεπληγμένους ὡς ἄμαχόν τινα τὸν Φιλιππον ἰδεῖν, ὅτι πάντα διεξελήλυθεν οἷς πρότερον παρακρουόμενος μέγας ηὐξήθη, καὶ πρὸς αὐτὴν ἥκει τὴν τελευτὴν τὰ πράγματ' αὐτῷ.

(*c*) Εἴ δέ τις ὑμῶν, ὦ ἄνδρες Ἀθηναῖοι, τὸν Φίλιππον εὐτυχοῦνθ' ὁρῶν ταύτῃ φοβερὸν προσπολεμῆσαι νομίζει, σώφρονος μὲν ἀνθρώπου λογισμῷ χρῆται· μεγάλη γὰρ ῥοπή, μᾶλλον δὲ τὸ ὅλον ἡ τύχη παρὰ πάντ' ἐστὶ τὰ τῶν ἀνθρώπων πράγματα· οὐ μὴν ἀλλ' ἔγωγ', εἴ τις αἵρεσίν μοι δοίη, τὴν τῆς ἡμετέρας πολέως τύχην ἂν ἑλοίμην, ἐθελόντων ἃ προσήκει ποιεῖν ὑμῶν αὐτῶν καὶ κατὰ μικρόν, ἢ τὴν ἐκείνου· πολὺ γὰρ πλείους ἀφορμὰς εἰς τὸ τὴν παρὰ τῶν θεῶν εὔνοιαν ἔχειν ὁρῶ ὑμῖν ἐνούσας ἢ 'κείνῳ.

(3) EURIPIDES, MEDEA.

(*a*) πολλὰς δ' ἔχουσα θανασίμους αὐτοῖς ὁδοὺς,
οὐκ οἶδ' ὁποίᾳ πρῶτον ἐγχειρῶ, φίλαι,

πότερον ὑφάψω δῶμα νυμφικὸν πυρὶ,
ἢ θηκτὸν ὥσω φάσγανον δι' ἤπατος,
σιγῇ δόμους ἐσβᾶσ' ἵν' ἔστρωται λέχος.
ἀλλ' ἕν τί μοι πρόσαντες· εἰ ληφθήσομαι
δόμους ὑπερβαίνουσα καὶ τεχνωμένη,
θανοῦσα θήσω τοῖς ἐμοῖς ἐχθροῖς γέλων.
κράτιστα τὴν εὐθεῖαν, ᾗ πεφύκαμεν
σοφοὶ μάλιστα,—φαρμάκοις αὐτοὺς ἑλεῖν.

(b) τὰν Κύπριν κλήζουσιν ἀφυσσαμέναν
χώραν καταπλεῦσαι μετρίοις ἀνέμων
ἡδυπνόοις αὔραις αἰεὶ δ' ἐπιβαλλομέναν
χαίταισιν εὐώδη ῥοδέων πλόκον ἀνθέων
τᾷ σοφίᾳ παρέδρους πέμπειν ἔρωτας,
παντοίας ἀρετᾶς ξυνέργους.
πῶς οὖν ἱερᾷ ποταμῷ
ἢ φίλῳ ἢ πόλις
πόμπιμός σε χώρᾳ
τὰν παιδολέτειραν ἔξει,
τὰν οὐχ ὁσίαν, μεταλλῶ;

(c) ἤδη δ' ἀνακλῶν κῶλον ἐκπλέθρου δρόμου
ταχὺς βαδιστὴς τερμόνων ἂν ἥπτετο.
ἡ δ' ἐξ ἀναύγου καὶ μύσαντος ὄμματος
δεινὸν στενάξασ' ἡ τάλαιν' ἠγείρετο.
διπλοῦν γὰρ αὐτῇ πῆμ' ἐπεστρατεύετο·
χρυσοῦς μὲν ἀμφὶ κρατὶ κείμενος πλόκος
θαυμαστὸν ἵει νᾶμα παμφάγου πυρός·
πέπλοι δὲ λεπτοί, σῶν τέκνων δωρήματα
λευκὴν ἔδαπτον σάρκα τῆς δυσδαίμονος.

GREEK TRANSLATION AT SIGHT.

WEDNEDAY, SEPTEMBER 18TH:—MORNING, 9 TO 10.

ὁ δ' Ἀγησίλαος σπεύδων μὲν ἐκ τῆς Ἀσίας ἐβοήθει· ὄντι δ' αὐτῷ ἐν Ἀμφιπόλει ἀγγέλλει Δερκυλίδας ὅτι νικῷεν τ' αὖ Λακεδαιμόνιοι καὶ αὐτῶν μὲν τεθνάναι ὄκτω, τῶν δὲ

πολεμίων παμπληθεῖς· ἐδήλου δὲ καὶ τῶν συμμάχων ὅτι οὐκ ὀλίγοι πεπτωκότες εἶεν. ἐρομένου δὲ τοῦ Ἀγησιλάου· Ἆρ' ἄν, ὦ Δερκυλίδα, ἐν καιρῷ γένοιτο, εἰ αἱ συμπέμπουσαι πόλεις ἡμῖν τοὺς στρατιώτας τὴν νίκην ὡς τάχιστα πύθοιντο; ἀπεκρίνατο δὴ ὁ Δερκυλίδας, Εὐθυμοτέρους γοῦν εἰκὸς ταῦτ' ἀκούσαντας εἶναι. Οὐκοῦν σύ, ἐπεὶ παρεγένου, κάλλιστ' ἂν ἀπαγγείλαις; ὁ δὲ ἄσμενος ἀκούσας εἶπεν, Εἰ σὺ τάττοις.

GREEK COMPOSITION, GRAMMAR AND HISTORY.

WEDNESDAY, SEPTEMBER 18TH:—AFTERNOON, 2 TO 5.

1. Translate into Greek:

As the ships sailed into the harbour, the army, drawn up along the sea, welcomed them—and they rejoiced greatly to see them, for if these ships, bringing supplies, had not arrived within three days, all those in the city would have perished of hunger. On the following day the general called them all together and told them that they must fight bravely to conquer the enemy and save their fatherland. For if the besiegers should succeed, they would be able also to capture Athens.

2. (a) Give the fut. act., aor. act., perf. pass. and aor. pass. of *αἱρέω*, *ἀποκτείνω*, *καθίστημι*, *ἔρχομαι*, *διατελέω*. Give only first singular of each tense and only forms actually used in Attic Prose.

(*b*) Give some account of the chief uses of the Genetive case, distinguishing carefully Homeric and At usages.

(*c*) Explain with examples:—

(i) The usage of *ἐπί*.

(ii) The ways of expressing *time* in Greek.

(iii) The constructions used with verbs of fearing.

3 (*a*) Give an outline of the circumstances which led Athens to abandon her land empire.

(*b*) What do you know of :—Polycrates, Cylon, Aristagoras, Ephialtes, Dionysius of Phocaea, Aristogeiton ?

(*c*) Explain :—Cleruch, Polemarch, Ephor, Prytaneia, Probouleuma, Dikast.

QUINTILIAN, CICERO, HORACE AND SIGHT TRANSLATION.

WEDNESDAY, SEPTEMBER 11TH :—MORNING, 9 TO 12 A.M.

1. Translate :—

(*a*) A philosophorum vero lectione ut essent multa nobis petenda, vitio factum est oratorum, qui quidem illis optima sui operis parte cesserunt. Nam et de iustis, honestis, utilibus, iisque quae sunt istis contraria, et de rebus divinis maxime dicunt et argumentantur acriter; et altercationibus atque interrogationibus oratorem futurum optime Socratici praeparant. To what does 'nam' refer?

(*b*) Et admiratus maxime est, ut saepe testatur, et eum secutus, quanquam in opere diverso, Menander, qui vel unus, meo quidem iudicio, diligenter lectus ad cuncta, quae praecipimus, efficienda sufficiat; ita omnem vitae imaginem expressit, tanta in eo inveniendi copia et eloquendi facultas, ita est omnibus rebus, personis affectibus accommodatus. Who is referred to by 'eum' ?

(*c*) Arte ille et toto genere dicendi praeferendus et quem in numero veterum habere non timeas; hic concitatior sed in cura verborum nimius et compositione non nunquam longior et translationibus parum modicus Erant clara et nuper ingenia.

Who are the two persons referred to here ?

2. State briefly Quintilian's criticism of Sallust, Persius, Ennius, Lucilius, Isocrates, Clitarchus, Aeschylus.

3. Translate :—

O Tite, si quid ego adiuero curamve levasso
quae nunc te coquit et versat in pectore fixa,
ecquid erit praemi ?

Licet enim mihi versibus isdem affari te, Attice, quibus affatur Flamininum.

ille vir haud magna cum re, sed plenus fidei,
Quamquam certo scio, non, ut Flamininum,
sollicitari te, Tite, sic noctesque diesque.

Novi enim moderationem animi tui et aequitatem, teque non cognomen solum Athenis deportasse sed humanitatem et prudentiam intellego.

What is the allusion in *cognomen Athenis deportasse ?*
Who is the 'ille vir' referred to ?
A note on the prosody of the line 'ille vir etc.'

4. Translate :—

Quorsus haec ? Ut intellegatis, si voluptatem aspernari ratione et sapien-

tia non possemus, magnam habendam senectuti gratiam, quae effecerit ut id non liberet quod non oporteret. Impedit enim consilium voluptas : rationi inimica est ac mentis, ut ita dicam, praestringit oculos, nec habet ullum cum virtute commercium. Invitus feci ut fortissimi viri T. Flamininni fratrem L. Flamininum et senatu eicerem septem annis post quam consul fuisset ; sed notandam putavi libidinem.

5. Translate : —

Fructus enim senectutis est, ut saepe dixi, ante partorum bonorum memoria et copia. Omnia vero, quae secundum naturam fiunt, sunt habenda in bonis. Quid est autem magis secundum naturam quam senibus emori? Quod idem contingit adulescentibus adversante et repugnante natura.

6. Translate :—

O crudelis adhuc et Veneris muneribus potens,
insperata tuae cum veniet pluma superbiae,
et quae nunc humeris involitant deciderunt comae,
nunc et qui color est puniceae flore prior rosae
mutatus Ligurinum in faciem verterit hispidam,
dices heu quotiens te speculo videris alterum ;
" quae mens est hodie, cur eadem non puero fuit ?
vel cur his animis incolumes non redeunt genae ?"

Scan the sixth line, and state what the metre is. Give an analysis of of the Alcaic metre, and quote one stanza from the Fourth Book.

7. For unseen Translation :—

A. The Emperor Caligula.

Non inmerito mentis valitudini attribuerim diversissima in eodem vitia, summam confidentiam et contra nimium metum, nam qui deos tanto opere contemneret, ad minima tonitrua et fulgura conivere, caput obvolvere, at vero maiore proripere se e strato sub lectumque condere solebat, peregrinatione quidem Siciliensi irrisis multorum locorum miraculis, repente a Messana noctu profugit Aetnaei verticis fumo ac murmure pavefactus, adversus barbaros quoque minacissimus, cum trans Rhenum inter angustias densumque agmen iter essedo faceret, dicente quodam non mediocrem fore consternationem sicunde hostis appareat, equum ilico conscendit ac propere reversus ad pontes, ut eos calonibus et impedimentis stipatos repperit, impatiens morae per manus ac super capita hominum translatus est.

Suetonius.

B. Virtues of old Rome.

Haec tum Roma fuit ; post te cui vertere mores
si stabat fatis, potius, Carthago, maneres.

Silius Italicus.

GEOMETRY—ALGEBRA—TRIGONOMETBY.

THURSDAY, SEPT. 12TH:—MORNING, 9 TO 12.

A.

1. Parallellograms which are equal in area, and which have one angle of the one equal to one angle of the other, have the sides about the equal angles reciprocally proportional.

2. Parallelograms which are equiangular to one another have to one another the ratio which is compounded of the ratios of their sides.

(*a*) The areas of two triangles are to one anothor in the ratio compounded of the ratios of their bases and of their altitudes.

3. Describe a rectilineal figure which shall be equal to one and similar to another rectilineal figure.

4. Inscribe a regular pentagon in a circle.

B.

5. Solve the equations

(*a*) $\frac{x}{x-2} - \frac{x+1}{x-1} = \frac{x-8}{x-6} - \frac{x-9}{x-7}$

(*b*) $\frac{x}{a} - \frac{y}{b} = 0, \quad bx + ay = 4ab$

(*c*) $\frac{1}{2x-5a} + \frac{5}{2x-a} = \frac{2}{a}$

6. Solve the equations

(*a*) $x^2 + y^2 = 65$

$xy = 28$

(*b*) $x^2 + xy = 15$

$y^2 + xy = 10$

(*c*) $\sqrt{x+25} = 1 + \sqrt{x}$

7. Simplify

(*a*) $(a+b)^{\frac{5}{3}} \times (a+b)^{\frac{2}{3}}$

(*b*) $\sqrt{252} - \sqrt{294} - 48\sqrt{\frac{1}{6}}$

(*c*) $8^{\frac{1}{2}} \times 27^{\frac{1}{3}} \times 64^{\frac{1}{4}}$

8. There is a number between 10 and 100; when multiplied by the digit on the left the product is 280; if the sum of the digits be multiplied by the same digit the product is 55; find the number.

9. Prove (1) $\tan A + \cot A = \sec A \operatorname{cosec} A$.

(2) $\dfrac{\cos x + \cos y}{\sin x + \sin y} + \dfrac{\sin x - \sin y}{\cos x - \cos y} = 0$

(3) $1 + \tan x \tan \dfrac{x}{2} = \sec x$.

C.

10. Prove that in any triangle, (1) $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

(2) $\cos \dfrac{A}{2} = \sqrt{\dfrac{s\,(s-a)}{bc}}$

11. In a triangle if $b = 585$, $c = 473$ and $A = 45°, 20', 30''$, find B and C and a.

12. The angle of elevation of a tower 100 feet high due north of an observer was 50° ; what will be its angle of elevation after walking due west 300 feet.

GEOMETRY.

THURSDAY, SEPTEMBER 12TH :—AFTERNOON, 2 TO 5.

1. Give the base and the difference of the two sides of a triangle; find the locus of the foot of the perpendicular from either end of the base on the bisector of the internal vertical angle.

2. Through a given point within a circle draw the minimum chord.

3. If perpendiculars be drawn from any point on the circumference of a circle to two tangents and their chord of contact, the square on the perpendicular to the chord is equal to the rectangle under the other two perpendiculars.

4. Describe a circle passing through a given point, and touching a given straight line at a given point.

5. If a transversal cut the sides of a triangle, the segments of any side are in a ratio compounded of the ratios of the segments of the other sides.

6. The radical axis of each pair of a system of three circles meet in a point.

7. Any line cutting a circle and passing through a fixed point is cut harmonically by the circle, the point and the polar of the point.

8. When three triangles are two by two in perspective, and have the same axis of perspective, their three centres of perspective are collinear.

9. Give the base of a triangle, the vertical angle, and the bisector of the vertical angle; construct the triangles.

10. If four collinear points form a harmonic system, their four polars with respect to any circle form a harmonic pencil.

11. Any two circles can be inverted themselves.

12. Any two fixed tangents to a circle are cut homographically by a variable tangent.

THEORY OF EQUATION—ALGEBRA.

TUESDAY, SEPTEMBER 24TH :—MORNING, 9 TO 12.

1. Apply Sturm's Theorem to show that the equation

$$x^4 + 3x^3 + 7x^2 + 10x + 1 = 0$$

has two real and two imaginary roots, and that one real root lies between . — 2 and — 1 and that the other is between — 1 and 0.

2. Find a superior limit of the positive roots of

$$x^7 + 4x^6 - 3x^5 + 5x^4 - 9x^3 - 11x^2 + 6x - 8 = 0.$$

3. Find the multiple roots of the equation

$$x^3 + x^2 - 16x + 20 = 0.$$

4. Find the maximum and minimum values of

$$f(x) = 3x^4 - 16x^3 + 6x^2 - 48x + 7.$$

5. Find the roots of the equation

$$x^5 + x^4 + x^3 + x^2 + x + 1 = 0.$$

6. Transform the equation

$$x^4 + 8x^3 + x - 5 = 0$$

into one which shall want the second term.

7. The equation

$$x^4 + 4x^3 - 2x^2 - 12x + 9 = 0$$

has two pair equal roots; find them.

8. Solv[illegible] cubic equation

$$x^3 - 1 = 0.$$

9. Find the present value of an amount to continue for a given number of years allowing compound interest.

10. Prove the truth of the binomial theorem for a positive integral index.

11. Express the denary number 5213 in the scale of seven.

12. The sum of three numbers in Geom. Prog. is 38, and their roduct is 1728; find them.

ENGLISH LITERATURE AND COMPOSITION.

FRIDAY, SEPTEMBER 13TH :—MORNING, 9 TO 12.30.

(*Write the answers to A, B and C in separate books.*)

A. SPENSER : *Faerie Queene, Book I.*

1. Explain the spiritual significance of the character of Una, and show how this is developed by the part she takes in the action of Book I.

2. Mention the historical events or persons alluded to in the stories of (*a*) Duessa, (*b*) Kirkrapine, (*c*) Archimago, (*d*) Orgoglio.

3. Explain the structure of the Spenserian stanza, and give a few examples from Book I. of the poet's felicity in versification.

4. Give the meaning of the following words : vantage, triplicity, whylome, tyne, owch, ment, counterfesaunce, darrayne, emprize, gent, fere, ramping, rapt, misseeming, elfin.

B. TENNYSON : *Selections.*

1. Give some idea, with the help of quotations, of Tennyson's treatment of natural scenery.

2. What is the fundamental idea in *The Lotos-Eaters* and in *Ulysses*?

3. Narrate the story in *Morte d'Arthur*.

4. Give four examples illustrating Tennyson's close observation of facts.

5. Make remarks on Tennyson's effective use of figures of comparison.

6. What are the principal characteristics of Tennyson's blank verse? Illustrate with the help of quotations.

C. ENGLISH COMPOSITION.

Write an essay of not less than three pages on any *one* of the following subjects :—

(*a*) The Spirit of Chivalry.
(*b*) The Religious Spirit in Spenser.
(*c*) Nature in Tennyson's Poetry.

ENGLISH LANGUAGE.

TRENCH : *Study of Words.*

TUESDAY, SEPTEMBER 16TH, :—AFTERNOON, 4 TO 5.15.

1. How does Trench speak of the language of savage tribes?

2. Illustrate the turn given to names.

3. Illustrate poetry in words.

4. What is said regarding *pain, plague, sin, expiation, michers, idiot*?

5. What use does Trench make of the words *sacrament, cardinal, leopard, Quaker, pheasant, peach, gentian?*

6. Use *marshal, alderman, damhele, pope* to illustrate the rise and fall of words.

7. Write on (*a*) Synonyms.
(*b*) Phonetic spelling.

CHURCH'S "BEGINNING OF THE MIDDLE AGES."

Two Hours.

1. By what new conditions were the Teutonic settlements in the Roman Empire affected?

2. Sketch the history of the Vandals.

3. Give an account of the Gothic kingdom in Spain thoroughout its whole course.

4. Follow the course of Frankish history to the end of the Merovingian period.

5. (*a*) Of what nature is the importance of the Eastern Empire in European history?

(*b*) Follow the progress of the Eastern Empire from Theodosius to Leo the Isaurian.

6. (*a*) What were the chief states of Europe at the close of the period with which Church deals?

(*b*) What was the general condition of each state at the same epoch?

ROMAN HISTORY.

Wednesday, September 11th:—Morning, 4 to 5.

1. Give a brief account of the wars of Rome in Greece and the East between 200 B. C. and 188 B. C., naming the principal generals employed.

2. What mention is made in this period of the following places: Numantia, Cirta, Cannæ, Aquae Sextiae, Zama, Aegates, Demetrias, Magnesia ad Sipylum, Ancyra, Pisae, Lilybaeum, Colline Gate. State precisely the situation of each.

3. What were the reforms of Sulla?

4. Give a brief account of the proposals of Ti. Gracchus.

5. Explain the functions and constitutional position of a dictator, praetor, proconsul, curule ædile, tribune of the people. Explain the form of procedure used against a Roman, when tried on a criminal charge.

FRENCH.

LUNDI, 16 SEPTEMBRE, 1901.—DE 9 HEURES A MIDI.

I. Donner les règles qui se rapportent aux mots : *Aigle, amour, délice, gens, feu, nu, ci-joint, quelque, air.*

II. Dans quels cas le verbe ayant plusieurs sujets apparents se met-il au singulier ? Citer des exemples à l'appui des règles.

III. Corriger les phrases suivantes et motiver les corrections :—
C'est à vous à qui je m'adresse.
De la manière dont vous parlez, je reconnais qu'il a tort.
L'enfant doit respecter et obéir à ses parents.
Ils ont expliqué chacun ses difficultés.
Je veux que vous faites ce travail.

IV. Quand *vingt* et *cent* sont-ils variables et quand sont-ils invariables ? Donner des exemples.

V. Faire accorder les verbes qui se trouvent ici à l'infinitif présent, en personne et en nombre avec les sujets, et les mettre au *temps* et au *mode* indiqués :

Passé défini :

Alexandre *mourir* à la fleur de l'âge. Eve *cueillir* et *manger* du fruit défendu. Nous *partir* de grand matin, nous *parcourir* le bois, nous *cueillir* des noisettes, vous *survenir*, nous *tressaillir* de joie, nous *partager* notre récolte. Vous *voir*. Alexandre et Napoléon *concevoir* et *exécuter* de grandes choses.

Subjonctif présent :

On désire que je *venir*, que tu *voir*, qu'il *pleuvoir* ; que nous *nous protéger*, que vous *savoir*, qu'ils *pouvoir*. Il faut que je *courir*, que tu *acquérir*, qu'il *mourir*, que nous *essuyer*, que tu *semer*, que *j'aller*, qu'ils *s'asseoir*.

VI. Indiquer les règles de l'emploi (*a*) du passé défini, (*b*) de l'imparfait de l'indicatif, (*c*) du mode du subjonctif.

VII. Traiter de l'accord (*a*) du participe passé des verbes conjugués avec l'auxiliaire *avoir* ; (*b*) des participes passés des verbes pronominaux (réfléchis) ; (*c*) des participes passés devant l'infinitif.

VIII. Traduire en français :—

Charles XII, king of Sweden, was born in Stockholm on the 27th of June, 1662. He lost his mother in his eleventh year, and was hardly fifteen years old when his father died. According to the will of the late king, he was not to be of age until he had past his eighteenth year ; but on the proposition of the minister Piper, the diet transferred the government to him as early as 1697. In the year 1700, Peter I, emperor of Russia, Frederick IV, king of Denmark, and August, elector of Saxony, declared war against him.—He attacked them one after the other, and gained at first brilliant victories, among others that of Narva, where with less than 8,000 Swedes he defeated 80,000 Russians, of whom more than twenty

thousand remained on the field of battle, while he lost only six hundred men. But later, when he penetrated into Russia, he lost the decisive battle of Pultawa, and was forced to take refuge on the Turkish territory with a feeble escort of two hundred and fifty Swedes.

IX. Ecrire une composition d'environ 200 mots sur le XXe. siècle.

FRENCH.

LUNDI, 16 SEPTEMBRE 1901 :—APRÈS-MIDI, DE 2 À 5 HEURES.

I. Traduire :

Au-dessus d'une assise de pierres toutes rongées s'élevait une grille de bois pourri à moitié tombée de vétusté, mais à laquelle se mariaient à leur gré des plantes grimpantes. De chaque côté de la porte à claire-voie s'avançaient les rameaux tortus de deux pommiers rabougris. Trois allées parallèles, sablées et séparées par des carrés dont les terres étaient maintenues au moyen d'une bordure en buis, composaient ce jardin que terminait, au bas de la terrasse, un couvert de tilleuls. A un bout, des framboisiers, à l'autre, un immense noyer qui inclinait ses branches jusque sur le cabinet du tonnelier. Un jour pur et le beau soleil des automnes naturels aux rives de la Loire commençaient à dissiper le glacis imprimé par la nuit aux pittoresques objets, aux murs, aux plantes qui meublaient ce jardin et la cour.

(*Eugénie Grandet*).

II. Donner des équivalents anglais pour les expressions suivantes :—
Il faut s'y prendre à temps, se brûler la cervelle, un coup de théâtre, faire un bon coup, gagner les bonnes grâces de quelqu'un, s'en tenir là, tout va de travers, avoir raison de quelque chose, parler à mots couverts, parler en pure perte, tendre l'oreille.

III. Raconter la vie de " Jack " (250 mots environ).

IV. Analyser un des deux caractères suivants : (250 mots environ)
le Père Grandet,
Eugénie Grandet.

V. Raconter un épisode tiré des *Pages choisies* de Michelet :—(250 mots environ).

GERMAN.

MONDAY, 16TH SEPTEMBER :—MORNING, 9 TO 12.

I. Translate and indicate briefly the context of the following extracts :—

Don Cesar.

(1). Ist's Wahl wenn des Gestirnes Macht den Menschen
Ereilt in der verhängnisvollen Stunde?
Nicht eine Braut zu suchen, ging ich aus,
Nicht wahrlich solches Eitle konnte mir

Zu Sinne kommen in dem Haus des Todes,
Denn dorten fand ich, die ich nicht gesucht...
Es war des Vaters ernste Totenfeier;
Im Volksgedräng verborgen, wohnten wir
Ihr bei, du weiszt's, in unbekannter Kleidung...
Mit schwarzem Flor behangen war das Schiff
Der Kirche, zwanzig Genien umstanden,
Mit Fackeln in den Händen, den Altar,
Vor dem der Totensarg erhaben ruhte,
Mit weiszbekreuztem Grabestuch bedeckt.
Und auf den Grabtuch sahe man den Stab
Der Herrschaft liegen und die Fürstenkrone,
Den ritterlichen Schmuck der goldnen Sporen,
Das Schwert mit diamantenem Gehäng.

(2). *Frau v. D.* Wie, Dorsigny, Sie können mir ins Gesicht behaupten, dasz Sie nicht kurz vorhin mit mir gesprochen haben? Musz ich Sie daran erinnern? Wie? Sie wissen nicht mehr, dasz Sie erst vor kurzem mit unsrer Tochter gesprochen, dasz Sie ihre Neigung zu unserm Neffen entdeckt haben und dasz wir eins worden sind, sie ihm zur Frau zu geben, sobald er wird angekommen sein?

Oberst. Ich weisz nicht, Madame, ob das alles nur ein Traum Ihrer Einbildungskraft ist, oder ob wirklich ein anderer in meiner Abwesenheit meinen Platz eingenommen hat. Ist das letztere, so war's hohe Zeit, dasz ich kam—Dieser jemand schlägt meinen Schwiegersohn tot, verheiratet meine Tochter und sticht mich aus bei meiner Frau, und meine Frau und meine Tochter lassen sich's beide ganz vortrefflich gefallen.

Frau v. D. Welche Verstockung! — In Wahrheit, Herr von Dorsigny, ich weisz mich in Ihr Betragen nicht zu finden.

Oberst. Ich werde nicht klug aus dem Ihrigen.

(3). Sie gingen durch mehrere Säle und Gänge und kamen endlich in die Küche. Es war dies ein groszes, weitläufiges Gebäude, herrlich eingerichtet; auf zwanzig Herden brannten beständig Feuer, ein klares Wasser, das zugleich zum Fischbehalter diente, flosz mitten durch sie, in Schränken von Marmor und köstlichem Holz waren die Vorrate aufgestellt, die man zur Hand haben muszte, und zur Rechten und Linken waren zehn Säle, in welchen Alles aufgespeichert war, was man in allen Ländern Köstliches und Leckeres für den Gaumen erfunden.

II. Translate.

Amos berief sich auf mehrere Bürger, die ihn wohl noch kennen und für ihn gutstehen würden. Allein jedesmal hiesz es, der sei verstorben oder verschollen, und die Soldaten wuszten nichts von ihm. Hundertmal brannte es Amos auf der Zunge, nach des Schulmeisters Marthe zu fragen; doch er brachte das Wort nicht über die Lippen; es war ihm, als könne er durch die Verzögerung der schlimmsten Antwort sein letztes, volles Elend selber noch hinauszögern.

III. (1). Dstinguish clearly, giving examples, between *aber*, *sondern* and *allein*.

(2). What classes of verbs require the auxiliary *sein*? Some verbs may take either *haben* or *sein*; name a few and explain, giving examples.

(3). Translate into German (using adverbs for the words in italics):— He *only* came this morning—*Well*, am I not right?—You thought of me now and then, *I suppose*—I will do it *this very day*—*Why* I told you so—*Even* if it were true.

(4). Translate the following idiomatic expressions from *Der Neffe als Onkel*:— (*a*) Es wird schwer halten. (*b*) Lassen Sie sich nicht zum Besten haben. (*c*) Und so heben wir gegen einander auf. (*d*) Ich möchte rasend werden. (*e*) Aufgeschoben ist nicht aufgehoben.

(5). Is there any difference between the two ways of rendering *there are* in German? Illustrate your answer.

GERMAN.

MONDAY, 16th SEPTEMBER, AFTERNOON, 2 to 5.

I. Translate (at sight) into good English:

(1) Die Wunde brennt; die bleichen Lippen beben. —
Ich fühl's an meines Herzens matterm Schlage,
Hier steh' ich an den Marken meiner Tage.—
Gott, wie du willst! Dir hab' ich mich ergeben.

Viel gold'ne Bilder sah ich um mich schweben;
Das schöne Traumbild wird zur Totenklage,—
Mut! Mut!—Was ich so treu im Herzen trage,
Das muß ja doch dort ewig mit mir leben!—

Und was ich hier als Heiligtum erkannte,
Wofür ich rasch und jugendlich entbrannte,
Ob ich's nun Freiheit, ob ich's Liebe nannte:

Als lichten Seraph seh' ich's vor mir stehen;—
Und wie die Sinne langsam mir vergehen,
Trägt mich ein Hauch zu morgenroten Höhen.

(2) Als am nächsten Morgen Anton bei dem Alten eintrat, ergriff dieser nach finsterm Gruß einen großen rostigen Schlüssel, zog langsam einen verschossenen Mantel an, auf welchem zahlreiche Kragen übereinander lagen wie die Schindelreihen auf einem Dach, und brachte den jungen Mann in einen entlegenen Stadttheil vor ein verfallenes Kloster. Sie schritten durch einen langen Kreuzgang. An der Wand waren die Leichensteine der alten Bewohner eingemauert; verwitterte Inschriften meldeten dem unaufmerksamen Geschlecht der Lebenden, daß einst fromme Mönche in diesen Räumen den Frieden gesucht hatten. In diesem Kreuzgange waren sie täglich, das Brevier in der Hand, auf und ab gegangen; hier hatten sie gebetet und geträumt, bis sie ihre arme Seele der Fürbitte ihres Heiligen übergeben

mußten. Im Innern des Gebäudes öffnete der Alte eine verborgene Thür, und führte seinen Begleiter auf gewundener Steintreppe hinab in ein großes Gewölbe. Einst hatte der Wein des großen Klosters darin gelegen, und der Bruder Kellermeister war, ach wie oft, dieselben Stufen hinabgegangen: er war zwischen den Reihen der Fässer umhergewandelt, hatte hier und da eine Probe ausgehoben, und wenn das Glöckchen über ihm läutete, hatte er schnell sein Haupt gesenkt und ein kleines Gebet gesprochen, und war darauf wieder an das Kosten gegangen, oder in behaglicher Stimmung auf und ab spaziert. Die Betglocken des Klosters waren längst eingeschmolzen, die leeren Zellen der Brüder hatten Risse, und Getreide wurde jetzt aufbewahrt, wo ehemals der Prior an der Spitze der Brüder beim Mahle saß. Alles war verschwunden, nur der Keller hatte sich erhalten; und wie vor vierhundert Jahren, lagen noch jetzt die Fässer des feurigen Ungarweins.

II. Translate into German. (at sight).

(1) After his conversation with the strange soldier Amos hastily left the inn. He had not gone far when he noticed that he was being pursued; and as he was unable to run very fast on account of his wounded leg, the crowd soon overtook him. He was told that he must give up all papers or valuables which he might have with him; and when he declared that he had nothing of value in his possession, they took him into the forest to a lonely spot on the banks of the Lahn and began to search him. Thereupon Amos, seeing that all hope was lost, suddenly drew the little bag from his pocket and flung it far out into the river.

(2., (*a*) I am sorry I was not at home when you came. (*b*) I forgot to take my dogs with me, but they reminded me by their howling. (*c*) Going to the woods I saw a man ploughing a field with a pair of oxen. (*d*) He entered hat in hand. (*e*) I am very desirous that you should pass this examination.

(3) We could neither advance nor stand still, and at every moment we had to grasp some little tree in order to be able to keep on our feet at all. You know that I am not timid, but I can assure you that it was no joke. While you are quietly reading my description you may perhaps smile. You will say: It served you right; you should have stayed at the inn. Well, I confess that that idea passed a couple of times through my own head, but it did not do any good. In a short time, of course, we were soaked through and through.

III. (1) Give an account of the friendship of Goethe and Schiller, and mention some works of each which were the result of their collaboration or mutual suggestion.

(2) Give an analysis of the plot of *Die Braut von Messina*, and discuss the use of the chorus in that drama.

SCHOLARSHIPS.

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SCHOLARSHIPS.

ANALYTIC GEOMETRY (*First Paper.*)

WEDNESDAY, SEPTEMBER 11TH:—MORNING, 9 TO 12.

1. Find the locus of the intersection of the perpendicular from the focus of a parabola on a tangent with the radius vector from the vertex to the point of contact.

2. Taking the focus of a parabola as origin, show that the equation of a tangent in terms of the angle which the perpendicular on it makes with the axis of x may be expressed by

$$x \cos \alpha + y \sin \alpha + \frac{m}{\cos \alpha} = 0.$$

3. Prove that in the parabola the subnormal is constant.

4. The equation of the hyperbola referred to the asymptotes as axes is

$$xy = \frac{a^2 + b^2}{4}$$

5. The sum of two focal chords of an ellipse drawn parallel to two conjugate diameters is constant.

6. The difference of the distance of any point on an hyperbola from the foci is constant and equal to the transverse axis.

7. If through any point two real lines can be drawn to meet the curve at infinity, parallel lines through any other point will meet the curve at infinity.

8. Taking the equation of a circle in polar co-ordinates, prove that if from any point O a straight line be drawn meeting the circle in points P and P', and if the point Q be taken so that OQ is a harmonic mean between P and P', the locus of Q is the polar of the point O.

9. Show that the condition that $Ax + By + C = 0$ should touch $(x - a)^2 + (y - b)^2 = r^2$ is

$$\frac{Aa + Bb + C}{\sqrt{A^2 + B^2}} = r$$

10. Find the equation which will represent the lines bisecting the angles between the lines represented by the equation

$$Ax^2 + Bxy + Cy^2 = 0.$$

11. Given base of a triangle and m times the square of one side + n times the square of the other, find the locus of the vertex.

12. Express the area of a triangle in terms of the co-ordinates of its angular points.

ANALYTIC GEOMETRY (*Second Paper*).

THURSDAY, SEPTEMBER 12TH:—MORNING, 9 TO 12.

1. Show that $\mu^2 E - 2\mu(S + S') + F^2 = o$ is the equation of a conic having double contact with two given conics $S = o$ and $S' = o$ when $E = o$ and $F = o$ are a pair of their chords of intersection.

2. If $L = o$ $M = o$ be the equation of two tangents to a conic, and $R = o$ that of their chord of contact, prove that $LM = R^2$ is the equation of the conic.

(*a*) Show that the equation of the chord joining any two points in the conic may be put in the shape

$$\mu\mu' L - (\mu + \mu') R + M = o.$$

3. Using the same axes as in question 2, show that the envelope of the base of a triangle, inscribed in a conic, whose two sides pass through fixed points, is

$$LM = \frac{(a+b)^2}{4ab} R^2$$

when a and b are given constants.

4. Given four points on a conic section, its chord of intersection with a fixed conic passing through two of these points will pass through a fixed point.

5. Show that two similar and concentric conics are to be regarded touching each other at two infinitely distant points.

6. Prove that two curves of the mth and n^{th} degree respectively intersect in $m\,n$ points.

7. Given three lines $\alpha = o$, $\beta = o$, $\gamma = o$, forming a triangle, show that the equation of any line

$$Ax + By + C = o.$$

can be put in the shape

$$l\alpha + m\beta + n\gamma = o.$$

8. Prove by trilinear co-ords. that the three bisectors of the sides of a triangle meet in a point.

9. If a line be such that the sum of the perpendiculars let fall on it from a number of fixed points, each multiplier by a constant $= o$, it will pass through a fixed point.

10. Three right lines will be concurrent, if their equations being multiplied each by a constant, and added together the sum is identically $= 0$.

11. Find the equation of the circle circumscribing the triangle

$$\alpha = o\,;\ \beta = o\,;\ \gamma = o$$

(*a*) Give the geometrical interpretation of the equals.

12. Show by trilinear co ords, that if from any point of a circle perpendiculars be let fall on any two tangents and on their chord of contact, the square of the last will be equal to the rectangle under the other two.

CALCULUS.

MONDAY, SEPT. 16TH:—MORNING, 9 TO 12.

1. Prove that any curve, the lengths of the polar subtangent and polar subuormal are $r^2\frac{d\theta}{dr}$ and $\frac{dr}{d\theta}$ respectiyely.

2. Prove that for any curve $\frac{ds}{dx} = \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$

3. Prove that the length of the perpendicular from the origin on the tangent to any curve $u = c$ is

$$p = \frac{x\frac{du}{dx} + y\frac{du}{dy}}{\sqrt{\left(\frac{du}{dx}\right)^2 + \left(\frac{du}{dy}\right)^2}}$$

4. Find the radius of curvature at any point of the cubical parabola $3a^2 y = x^3$.

5. Find the evolute of the parabola.

6. Find the conditions for a maximum or minimum value of a given function of x.

7. Taking the equation of the cycloid as given by

$$x = a(\phi + \sin\phi),\ z = a(1 + \cos\phi)$$

find the whole surface generated by the revolution of the curve round its base.

8. A solid sector is cut out of a sphere of 10 ft. radius by a cone, the angle of which is 120°; find the radius of the sphere whose solid contents are equal to those of the sector.

9. Define the tractrix, find its differential equation, and thence its equation.

10. In the hyperbolic spiral $r\theta = a$, prove that the area bounded by any two radii vectors is proportional to the difference between their engths.

11. Integrate the expression

$$\{f(x) + f'(x)\} e^x \, dx$$

12. Show how to integrate

$$\frac{f(\cos x, \sin x)\, dx}{a \cos x + b \sin x + c}.$$

13. Find the formula of reduction for

$$\int \frac{dx}{(a + b \cos x)^n}$$

14. Integrate

$$\int \frac{dx}{(a^2 + x^2)^{\frac{3}{2}}}; \quad \int \frac{dx}{x^2 (1 + x^4)^{\frac{3}{4}}}.$$

15. Integrate

$$\int \frac{dx}{x\sqrt{a + 2bx + cx^2}}; \quad \int \frac{dx}{(a + cx^2)^{\frac{3}{2}}}; \quad \int \frac{x^5 \, dx}{\sqrt{1 + x^2}}.$$

HIGHER ALGEBRA—THEORY OF EQUATION.

TRIGONOMETRY.

TUESDAY, SEPTEMBER 17TH:—MORNING, 9 TO 12.

1. Find the value of the determinant

8	7	2	20
2	1	4	7
5	0	11	0
8	1	0	6

2. Prove that if every constituent in any row or column of a determinant can be resolved into the sum of two others, the determinant can be resolved with the sum of two others.

3. If a determinant vanish, its minors, A_1, A_2, etc., are respectively proportioned to B_1, B_2, etc.

4. Define the *reciprocal* of a given determinant, and prove that

$$(A_1 \; B_2 \; C_3)^2 = (a_1 \; b_2 \; c_3)^2$$

5. If the roots of the equation

$$x^3 + px^2 + qx + r = 0$$

be a, b, c, form the equation whose roots are

$$\frac{a}{b + c}, \quad \frac{b}{c + a}, \quad \frac{c}{a + b}$$

6. Every equation of an odd degree has at least one real root.

7. Show by Sturm's Theorem that the equation

$$x^3 - 6x^2 + fx + 40 = 0$$

has only one real root.

8. Remove the second term and solve the equation

$$x^3 - 18x^2 + 157x - 510 = 0$$

9. In a right-angled spherical triangle (C being the right angle) given

$c = 81° 29' 32''$ $A = 32° 28' 17''$, find B.

10. In an oblique-angled spherical triangle being given

$a = 100°$, $b = 37° 18'$, $c = 62° 46'$, find A.

11. In a spherical triangle prove

$$\sin \tfrac{1}{2} A = \sqrt{\frac{\sin (s - b) \sin (s - c)}{\sin b \sin c}}$$

12. Investigate any method of approximating to the value of π.

LOGIC.

MONDAY, SEPT. 21ST:—2 TO 5 P.M.

1. What is the scope of Logic and how may the Science be defined?

2. Formulate the two fundamental principles of rational thought and explain their philosophical significance.

3. Explain the nature and give the rules of Definition, illustrating, if possible, by examples.

4. What are the chief kinds of propositions, and how do they stand to one another?

5. Explain the nature and rules of the Syllogism, giving examples of *Barbara*, *Camestris* and *Festino*. Why did Aristotle consider the first figure the only perfect one? *Or* explain Sir William Hamilton's quantification of the predicate, and write out in his notation the moods: *Baroko*, *Darapti*, *Felapton* and *Bokardo*.

6. State the principal division of the Fallacies, and explain the following, giving an example of each: *A dicto secundum quid ad dictum simpliciter; ignoratio elenchi; argumentum ad hominem; argumentum ad populum; petitio principii; circulus in probando; non sequitur; post hoc ergo propter hoc.*

7. Test the following arguments:

(*a*) Nothing is better than wisdom; dry bread is better than nothing; therefore, dry bread is better than wisdom.

(*b*) The various species of brutes being created to prey upon one another proves that the human species was intended to prey upon them.

(*c*) The *minimum visible* is the least magnitude which can be seen : no part of it alone is visible, and yet all parts of it must affect the organ of sight in order that it may be visible ; therefore, every part of it must affect that organ without being visible.

8. Describe the arguments from Analogy, giving two examples.

9. State and illustrate the canon of the Method of Difference, and point out its relation to the Method of Residues. What is your opinion of the value of these two Methods ?

10. Define Hypothesis, and shew by an example the difference between Hypothesis and Theory ; *or* explain the nature and value of Classification distinguishing between natural and artificial Classification.

LOGIC.

WEDNESDAY, SEPTEMBER 18TH.

Answer not more than nine questions.

1. What is Inference ? Show the difference between Deductive and Inductive Reasoning, noticing briefly the main forms assumed by both.

2. Explain the relation of division to definition. Give an example of perfect definition and of logical divi ion.

3. Mention with illustrations some characteristics of the 1st, 2nd and 3rd Figures, respectively.

4. Test the reasoning in the following examples :
   (*a*) There is now less punishment in our great schools than formerly, but then less is learned there.
   (*b*) What one of the Gospels hath more than another is only profitable, and not necessary, necessary indeed to be believed because revealed, but not therefore revealed because it is necessary to be believed.
   (*c*) I am sensible, sir, that all which I have asserted is admitted in the gross, but that quite a different conclusion is drawn from it. America, gentlemen say, is a noble object, an object well worth fighting for. Certainly it is, if fighting a people be the best way of gaining them.

5. Explain briefly the following :
   Natural kind, Residual Phenomenon, Empirical method, Analysis and Synthesis, Uniformity of Nature, A priori and a posteriori, Post hoc ergo propter hoc.

6. Give a short account of Leibnitz's views on knowledge.

7. What are the requisites of a good classification ? Give illustrations, and show the relation between classification and abstraction.

8. Show the part played by Hypothesis in the deductive method of scientific investigation.

9. Write brief notes on the following:
Dictum de omni et nullo, Irregular Syllogisms, Ambiguity of Terms, Petitio Principii.

10. Comment on the following statement:
"The great requisite of a true philosopher is that he be perfectly unbiassed, and abandon every opinion as soon as facts inconsistent with it are observed."—Jevons.

GREEK AUTHORS.

WEDNESDAY, SEPTEMBER 18TH. MORNING 9 TO 12.

Translate, with notes on words and phrases underlined;—

(I.) SOPHOCLES, ANTIGONE.

(a) πότερον ὑπερτιμῶντες ὡς εὐεργέτην
ἔκρυπτον αὐτόν, ὅστις ἀμφικίονας
ναοὺς πυρώσων ἦλθε κἀναθήματα
καί γῆν ἐκείνων, καὶ νόμους διασκεδῶν;
ἢ τοὺς κακοὺς τιμῶντας εἰσορᾷς θεούς;
οὐκ ἔστιν. ἀλλὰ ταῦτα καὶ πάλαι πόλεως
ἄνδρες μόλις φέροντες ἐρρόθουν ἐμοί,
κρυφῇ κάρα σείοντες, οὐδ' ὑπὸ ζυγῷ
λόφον δικαίως εἶχον, ὡς στέργειν ἐμέ.

b) τεάν, εὖ, δύνασιν τίς ἀνδρῶν ὑπερβασία κατάσχοι;
τὰν οὔθ' ὕπνος αἱρεῖ ποθ' ὁ πάντ' ἀγρεύων,
οὔτε θεῶν ἄκμητοι μῆνες, ἀγήρως δὲ χρόνῳ
δυνάστας κατέχεις Ὀλύμπου μαρμαρόεσσαν αἴγλαν.
τό τ' ἔπειτα καὶ τὸ μέλλον
καὶ τὸ πρὶν ἐπαρκέσει
νόμος ὅδ'· οὐδὲν ἕρπει
θνατῶν βιότῳ πάμπολύ γ' ἐκτὸς ἄτας.

(c) ζεύχθη δ' ὀξύχολος παῖς ὁ Δρύαντος,
Ἠδωνῶν βασιλεύς κερτομίοις ὀργαῖς,
ἐκ Διονύσου πετρώδει κατάφαρκτος ἐν δεσμῷ·
οὕτω τᾶς μανίας δεινὸν ἀποστάζει
ἀνθηρόν τε μένος. κεῖνος ἐπέγνω μανίαις
ψαύων τὸν θεὸν ἐν κερτομίοις γλώσσαις.
παύεσκε μὲν γὰρ ἐνθέους γυναῖκας εὐιόν τε πῦρ
φιλαύλους τ' ἠρέθιζε Μούσας.

To what myth is reference here made ?

d) παιδός με σαίνει φθόγγος. ἀλλά, πρόσπολοι,
ἴτ' ἆσσον ὠκεῖς, καὶ παραστάντες τάφῳ
ἀθρήσαθ', ἁρμὸν χώματος λιθοσπαδῆ
δύντες πρὸς αὐτὸ στόμιον, εἰ τὸν Αἵμον
φθόγγον συνίημ', ἢ θεοῖσι κλέπτομαι.
τάδ' ἐξ ἀθύμου δεσπότου κελευσμάτων
ἠθροῦμεν· ἐν δὲ λοισθίῳ τυμβεύματι
τὴν μὲν κρεμαστὴν αὐχένος κατείδομεν,
βρόχῳ μιτώδει σίνδονος καθημμένην,
τὸν δ' ἀμφὶ μέσσῃ περιπετῆ προσκείμενον,
εὐνῆς ἀποιμώζοντα τῆς κάτω φθορὰν
καὶ πατρὸς ἔργα καὶ τὸ δύστηνον λέχος.

(2) THUCYDIDES VI.

(a) καὶ αὐτὰ ὑπολαμβάνοντες οἱ μάλιστα τῷ Ἀλκιβιάδῃ ἀχθόμενοι ἐμποδὼν ὄντι σφίσι μὴ αὐτοῖς τοῦ δήμου βεβαίως προεστάναι, καὶ νομίσαντες, εἰ αὐτὸν ἐξελάσειαν, πρῶτοι ἂν εἶναι, ἐμεγάλυνον καὶ ἐβόων ὡς ἐπὶ δήμου καταλύσει τά τε μυστικὰ καὶ ἡ τῶν Ἑρμῶν περικοπὴ γένοιτο καὶ οὐδὲν εἴη αὐτῶν ὅ τι οὐ μετ' ἐκείνου ἐπράχθη, ἐπιλέγοντες τεκμήρια τὴν ἄλλην αὐτοῦ ἐς τὰ ἐπιτηδεύματα οὐ δημοτικὴν παρανομίαν.

b) τὸ γὰρ πρῶτον πᾶν στράτευμα δεινότατον εἶναι· ἢν δὲ χρονίσῃ πρὶν ἐς ὄψιν ἐλθεῖν, τῇ γνώμῃ ἀναθαρσοῦντας ἀνθρώπους καὶ τῇ ὄψει καταφρονεῖν μᾶλλον. αἰφνίδιοι δὲ ἦν προσπέσωσιν, ἕως ἔτι περιδεεῖς προσδέχονται, μάλιστ' ἂν σφεῖς περιγενέσθαι καὶ κατὰ πάντα ἂν αὐτούς ἐκφοβῆσαι, τῇ τε ὄψει (πλεῖστοι γὰρ ἂν νῦν φανῆναι) καὶ τῇ προσδοκίᾳ ὧν πείσονται, μάλιστα δ' ἂν τῷ αὐτίκα κινδύνῳ τῆς μάχης.

(*c*) τῇ δὲ αὐτῇ ἰδέᾳ ἐκεῖνά τε ἔσχον καὶ τὰ ἐνθάδε νῦν πεῤῥῶνται· ἡγεμόνες γὰρ γενόμενοι ἑκόντων τῶν τε Ἰώνων καὶ ὅσοι ἀπὸ σφῶν ἦσαν ξύμμαχοι ὡς ἐπὶ τοῦ Μήδου τιμωρίᾳ, τοὺς μὲν λιποστρατίαν, τοὺς δὲ ἐπ' ἀλλήλους στρατεύειν τοῖς δ' ὡς ἑκάστοις τινὰ εἶχον αἰτίαν εὐπρεπῆ, ἐπενεγκόντες κατεστρέψαντο. καὶ οὐ περὶ τῆς ἐλευθερίας ἄρα οὔτε οὗτοι τῶν Ἑλλήνων οὔθ' οἱ Ἕλληνες τῆς ἑαυτῶν τῷ Μήδῳ ἀντέστησαν, περὶ δὲ οἱ μὲν σφίσιν ἀλλὰ μὴ ἐκείνῳ καταδουλώσεως, οἱ δ' ἐπὶ δεσπότου μεταβολῇ οὐκ ἀξυνετωτέρου κακοξυνετωτέρου δέ.

(*d*) καὶ ἔκπληξιν τοῖς Συρακοσίοις παρέσχον τῷ τάχει τῆς οἰκοδομίας· καὶ ἐπεξελθόντες μάχην διενοοῦντο ποιεῖσθαι καὶ μὴ περιορᾶν. καὶ ἤδη ἀντιπαρατασσομένων ἀλλήλοις οἱ τῶν Συρακοσίων στρατηγοὶ ὡς ἑώρων σφίσι τὸ στράτευμα διεσπασμένον τε καὶ οὐ ῥᾳδίως ξυντασσόμενον, ἀνήγαγον πάλιν ἐς τὴν πόλιν πλὴν μέρους τινὸς τῶν ἱππέων· οὗτοι δὲ ὑπομένοντες ἐκώλυον τοὺς Ἀθηναίους λιθοφορεῖν τε καὶ ἀποσκίδνασθαι μακροτέραν.

(3) PLATO, SELECTIONS.

(*a*) Δόξαν ἡμῖν ταῦτα ἐπορευόμεθα. ἐπειδὴ δὲ ἐν τῷ προθύρῳ ἐγενόμεθα, ἐπιστάντες περί τινος λόγου διελεγόμεθα, ὅς ἡμῖν κατὰ τὴν ὁδὸν ἐνέπεσεν· ἵν' οὖν μὴ ἀτελὴς γένοιτο ἀλλὰ διαπερανάμενοι οὕτως ἐσίοιμεν, στάντες ἐν τῷ προθύρῳ διελεγόμεθα, ἕως συνωμολογήσαμεν ἀλλήλοις. δοκεῖ οὖν μοι, ὁ θυρωρός, εὐνοῦχός τις, κατήκουεν ἡμῶν, κινδυνεύει δὲ διὰ τὸ πλῆθος τῶν σοφιστῶν ἄχθεσθαι τοῖς φοιτῶσιν εἰς τὴν οἰκίαν.

(*b*) ἃς δέ σὺ λέγεις τὰς σκέψεις περὶ τε ἀναλώσεως χρημάτων καὶ δόξης καὶ παίδων τροφῆς, μὴ ὡς ἀληθῶς ταῦτα, ὦ Κρίτων, σκέμματα ᾖ τῶν ῥᾳδίως ἀποκτιννύντων καὶ ἀναβιωσκομένων γ' ἄν, εἰ οἷοί τε ἦσαν, οὐδενὶ ξὺν νῷ, τούτων τῶν πολλῶν.

(c) Τῷ ὄντι ἄρα, ἔφη, ὦ Σιμμία, οἱ ὀρθῶς φιλοσοφοῦντες ἀποθνήσκειν μελετῶσι, καὶ τὸ τεθνάναι ἥκιστ' αὐτοῖς ἀνθρώπων φοβερόν. ἐκ τῶνδε δὲ σκόπει. εἰ γὰρ διαβέβληνται μὲν πανταχῇ τῷ σώματι, αὐτὴν δὲ καθ' αὑτὴν ἐπιθυμοῦσι τὴν ψυχὴν ἔχειν, τούτου δὲ γιγνομένου εἰ φοβοῖντο καὶ ἀγανακτοῖεν, οὐ πολλὴ ἂν ἀλογία εἴη, εἰ μὴ ἄσμενοι ἐκεῖσε ἴοιεν, οἳ ἀφικομένοις ἐλπίς ἐστιν οὗ διὰ βίου ἥρων τυχεῖν· ἥρων δὲ φρονήσεως· ᾧ τε διεβέβληντο, τούτου ἀπηλλάχθαι ξυνόντος αὐτοῖς.

(d) ἐν δὲ τῇ περιόδῳ καθορᾷ μὲν αὐτὴν δικαιοσύνην, καθορᾷ δὲ σωφροσύνην, καθορᾷ, δὲ ἐπιστήμην, οὐχ ᾗ γένεσις πρόσεστιν, οὐδ' ἥ ἐστί που ἑτέρα ἐν ἑτέρῳ οὖσα ὧν ἡμεις νῦν ὄντων καλοῦμεν, ἀλλὰ τὴν ἐν τῷ ὅ ἐστιν ὂν ὄντως ἐπιστήμην οὖσαν· καὶ τἆλλα ὡσαύτως τὰ ὄντα ὄντως θεασαμένη καὶ ἑστιαθεῖσα, δῦσα πάλιν εἰς τὸ εἴσω τοῦ οὐρανοῦ, οἴκαδε ἦλθεν. ἐλθούσης δὲ αὐτῆς ὁ ἡνίοχος πρὸς τὴν φάτνην τοὺς ἵππους στήσας παρέβαλεν ἀμβροσίαν τε καὶ ἐπ' αὐτῇ νέκταρ ἐπότισε.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

WEDNESDAY, SEPTEMBER 18TH.—2 TO 5 P.M.

1. Translate into Greek :

Charidemus, who lived in Ætolia, had as servant one of the natives, who, as is often the case with the Ætolians, was clever and ready-witted, but not always honest. And he noticed, that when a fowl was placed on the table for dinner, it always lacked one leg. And when he summoned the Ætolian to rebuke him, the slave bade him follow to the building where the fowls lived and showed him (for it was evening) that they had only one leg, for they were sleeping, as usual, standing on only one of their legs. But the master clapped his hands so that the birds awoke and it was evident that they had two legs.

The slave, however, as though unjustly accused, replied: "O wisest of masters, if you had only done that at dinner, the other leg would have then also appeared."

2. Translate into English:—

(a) καὶ Βάττος μὲν ὁ ἕτερος τῶν στρατηγῶν (δύο γὰρ ἦσαν ἐν τῇ μάχῃ οἱ παρόντες) λαβὼν λόχον ἦλθεν ἐπὶ τὴν Σολύγειαν κώμην φυλάξων ἀτείχιστον οὖσαν· Λυκόφρων δὲ τοῖς ἄλλοις ξυνέβαλε. καὶ πρῶτον μὲν τῷ δεξίῳ κέρᾳ τῶν Ἀθηναίων εὐθὺς ἀποβεβηκότι πρὸ τῆς χερσονήσου οἱ Κορίνθιοι ἐπέκειντο, ἔπειτα δὲ καὶ τῷ ἄλλῳ στρατεύματι. καὶ ἦν ἡ μάχη καρτερὰ καὶ ἐν χερσὶ πᾶσα. καὶ τὸ δεξιὸν κέρας τῶν Ἀθηναίων καὶ Καρυστίων (οὗτοι γὰρ παρατεταγμένοι ἦσαν ἔσχατοι) ἐδέξαντό τε τοὺς Κορινθίους καὶ ἐώσαντο μόλις· λόχος δὲ τις τῶν Κορινθίων ἐπιβοηθήσας τῷ εὐωνύμῳ κέρᾳ ἑαυτῶν ἔτρεψε τῶν Ἀθηναίων τὸ δεξιὸν κέρας καὶ ἐπεδίωξεν ἐς τὴν θάλασσαν· πάλιν δὲ ἀπὸ τῶν νεῶν ἀνέστρεψαν οἵ τε Ἀθήναιοι καὶ οἱ Καρύστιοι. τὸ δὲ ἄλλο στρατόπεδον ἀμφοτέρωθεν ἐμάχετο συνεχῶς.

(b) παῖδας δὲ δὴ τί τούσδ' ἀποκτεῖναι θέλεις;
τί σ' οἵδ' ἔδρασαν; ἕν τι σ' ἡγοῦμαι σόφον
εἰ τῶν ἀρίστων τἄκγον' αὐτὸς ὢν κακὸς
δέδοικας. ἀλλὰ τοῦθ' ὅμως ἡμῖν βαρὺ,
εἰ δειλίας σῆς κατθανούμεθ' οὕνεκα,
ὅ χρῆν σ' ὑφ' ἡμῶν τῶν ἀμεινόνων παθεῖν,
εἰ Ζεὺς δικαίας εἶχεν εἰς ἡμὰς φρένας.
εἰ δ' οὖν ἔχειν γῆς σκῆπτρα τῆσδ' αὐτὸς θέλεις
ἔασον ἡμᾶς φυγάδας ἐξελθεῖν χθονός·
βίᾳ δὲ δράσῃς μηδέν. ἢ πείσει Βίαν,
ὅταν θεὸς σοι πνεῦμα μεταβαλὼν τύχῃ

HORACE AND CICERO.

WEDNESDAY, SEPTEMBER 11TH:—MORNING, 9 TO 10.30

1. Translate:—

(a) nam cur
quae laedunt oculos festinas demere, si quid
est animum differs curandi tempus in annum?

(*b*) Vir bonus, omne forum quem spectat et omne tribunal,
quandocumque deos vel porco vel bove placat,
Jane pater, clare, clare cum dixit, Apollo ;
labra movet metuens audiri : pulcra Laverna,
da mihi fallere, da iusto sanctoque videri,
noctem peccatis et fraudibus obice nubem,
qui melior servo, qui liberior sit avarus,
in triviis fixum cum se demittit ob assem,
non video , nam qui cupiet metuet quoque ; porro,
qui metuens vivet liber mihi non erit unquam.
perdidit arma, locum virtutis deseruit, qui
semper in augenda festinat et obruitur re.

2. Translate, adding a line of explanation :—

(*a*) Spectatum satis et donatum iam rude.
(*b*) Sed quadringentis sex septem milia desunt.
(*c*) Vina bibes iterum Tauro diffusa.
(*d*) Cras nato Caesare festus
dat veniam somnumque dies.
(*e*) Tu quotus esse velis rescribe.
(*f*) Officiosaque sedulitas et opella forensis
adducit febres et testamenta resignat.
(*g*) Vilia vendentem tunicato scruta popello.
(*h*) Nam tua res agitur paries cum proximus ardet.

3. Translate :—

(*a*) Nam si ita esset, quod patres apud maiores nostros tenere non potuerunt, ut reprehensores essent comitiorum, id haberent iudices vel quod multo etiam minus esset ferendum : tum enim magistratum non gerebat is, qui ceperat, si patres auctores non eraut facti : nunc postulatur a vobis, ut eius exilio, qui creatus sit, iudicium popul Romani reprehendatis.

(*b*) Itaque hac spe decedebam, ut mihi populum Romanum ultro omnia delaturum putarem. At ego cum casu diebus iis itineris faciendi causa decedens e provincia Puteolos forte venissem, cum plurimi et lautissimi in iis locis solent esse, concidi paene, iudices, cum ex me quidam quaesisset quo die Roma exissem et numquidnam esset novi. Cui cum respondissem, me e provincia decedere : etiam me hercule, inquit, ut opinor, ex Africa ; hinc ego iam stomachans fastidiose; immo ex Sicilia, inquam.

(*c*) Rhodi enim, inquit, ego non fui : me vult fuisse : sed fui-inquit—putabam in Vaccaeis dicturum—bis in Bithynia.

(*d*) Illud semper magnificum et praeclarum putavi, clarorum virorum atque magnorum non minus otii quam negotii rationem exstare oportere.

To whom is this saying attributed ?

(*e*) Non potentia mea sed causa rogationis fuit gratiosa.

(*f*) His levioribus comitiis diligentia et gratia petitorum honos paritur non iis ornamentis, quae esse in te videmus.

WEDNESDAY, SEPTEMBER 11TH :—MORNING, 10.30 TO 12.

Virgil, Aeneid VI; Sallust, Catiline.

1. Translate, with brief comments :

(*a*) Virgil, Aeneid VI, 14— 18;
(*b*) " " " 98—101;
(*c*) " " " 222—225;
(*d*) " " " 467—471;
(*e*) " " " 724—729.
(*f*) Sallust, Catiline, Chapt. XX; *Ni virtus..... ..... amicitia est..*
(*g*) " " Chapt. LVIII; *Compertum ego .....nequiverim*

2. From what quarters has Virgil drawn the main ideas of the sixth book of the Aeneid ? Name some of the most famous imitations of the episode of a visit to the underworld in modern poetry.

3. Remark on the grammatical construction of *sineret* (v. 31), *perlegerent* (v. 34), *videri* (v. 49), *defuerint* (v. 88), *maria* (v. 351).

4. Translate the following sentences and explain more fully the meaning of each :

(*a*) prohibitus erat consulatum petere quod intra legitumos dies profiter nequiverit.

(*b*) ei utrique ad urbem imperatores erant, impediti ne triumpharent calumnia paucorum.

(*c*) isque postea permotus oratione C. Caesaris pedibus in sententiam Ti. Neronis iturum se dixerat.

WEDNESDAY, SEPTEMBER 11TH :—2 TO 5 P.M.

I.—LATIN COMPOSITION.

Rival factions divided and weakened the city of Hannibal. The wealthy merchants advocated submission to Rome; the popular party cried out for war. When the former gained the upper hand, they sent a humble embassy to Rome. But the levies had already begun. Nevertheless, the Roman Senate agreed to spare Carthage, if three hundred of her young nobles were sent across the sea as hostages. Another embassy from Carthage was met with a demand for all arms and engines of war. These were yielded up. But when the consuls declared that Carthage must be

razed, and a new city built at a distance from the sea, the Carthaginian people broke into a roar of fury and prepared for war. So resolute was the spirit of defence that the Carthaginian ladies cut off their long hair to supply material for twisted bow-strings.

II.—TRANSLATION AT SIGHT.

A DESCRIPTION OF OVID'S PLACE OF EXILE.

Cum glacialis hiemps squalentia protulit ora,
Terraque marmoreo candida facta gelu est;
Nix iacet, et iactam nec sol pluviaeve resolvunt
Indurat Boreas perpetuamque facit.
Ego ubi delicuit nondum prior, altera venit;
Et solet in multis bima manere locis.
Tantaque commoti vis est Aquilonis, ut altas
Aequet humo turres tectaque rapta ferat.
Pellibus et sutis arcent male frigora bracis;
Oraque de toto corpore sola patent.
Saepe sonant moti glacie pendente capilli,
Et nitet inducto candida barba gelu.
Udaque consistunt formam servantia testae,
Vina nec hausta meri, sed data frusta bibunt.
Quid loquar ut vincti concrescant frigore rivi,
Deque lacu fragiles effodiantur aquae?
Ipse, papyrifero qui non angustior amne
Miscetur vasto multa per ora freto,
Caeruleos ventis latices durantibus Ister
Congelat, et tectis in mare serpit aquis.
Quaque rates ierant, pedibus nunc itur, et undas
Frigore concretas ungula pulsat equi.
Perque novos pontes, subterlabentibus undis,
Ducunt Sarmatici barbara plaustra boves.

MYERS' "MEDIAEVAL AND MODERN HISTORY," PART I.

THREE HOURS.

1. Sketch the establishment of Christianity in England.
2. Describe the spirit and the institutions of chivalry.
3. Estimate the nature of intellectual life during the Middle Ages.
4. Give an account of:
   (*a*) The Second Crusade;
   (*b*) The Fourth Crusade.
5. Trace the rise of:
   (*a*) The Huns;
   (*b*) The Ottoman Turks.
6. Outline the history of Germany, 1273-1438.
7. Mark the main stages in the course of the Hundred Years' War.

ENGLISH LITERATURE.

FRIDAY, SEPTEMBER 13TH—9 TO 12 A.M.

A. SHAKSPERE :—*Tempest.*

1. Sketch the characters of Trinculo and Stephano, aud show how they add to the humour of the action.

2. State precisely the relation of the Tempest to Florio's translation of Montaigne's Essays and the conclusions that may be drawn from the facts.

3. Show, with the help of quotations, the peculiar excellences of the songs in this play.

4. Contrast the characters of Ariel and Caliban.

B. MILTON :—*Paradise Lost, Books I and II.*

1. Give the names of the chief fallen angels, and add explanatory notes.

2. Narrate Satan's journey after the Council.

3. Give instances from Books I. and II. (*a*) of Milton's felicity of diction, and (*b*) of the variety and power of his versification.

4. Explain the phrases "servile offerings," "the great consult," "Panim chivalry," "the winged Heralds," "blazing cressets," "obdurèd breast," "fallacious hope," "Typhœan rage," "empyreal Heaven," "the buxom air," "arbitrary punishment."

ENGLISH LITERATURE AND COMPOSITION.

FRIDAY, SEPT. 13TH—2 TO 5 P.M.,

LAMB: *Essays of Elia.*

1. Discuss various aspects of Essay-writing.

2. Write on the characteristics of Charles Lamb's Essays.

3. Give the substance of
   (*a*) The Essay on Ears.
   (*b*) The Essay on Artificial Comedy.

4. Give the titles of the Essays from which the following extracts are taken.
   (*a*) "Is there no clergyman here?"
   (*b*) What a place to be in is an old library!
   (*c*) He must be roasted.
   (*d*) Just below Dodsley's dramas want their fourth volume.
   (*e*) To love all the pretty dears, because children are so engaging!
   (*f*) I was a poor friendless boy.
   (*g*) What an Aguecheek the stage lost in him!

(*h*) Bells, the music nighest bordering upon heaven.
(*i*) I knew this Lovel.
(*j*) Pope was her favourite author.
(*k*) I was in Persepolis for the time.
(*l*) Silence—eldest of things.
(*m*) *His* noun.
(*n*) I have been trying all my life to like Scotchmen.
(*o*) In these little visual interpretations, no emblem is so common as the *heart*.
(*p*) Had I twenty girls, they should be brought up exactly in this fashion.

ENGLISH COMPOSITION.

Write an essay on any *one* of the following subjects :

A. The Dramatic Construction of *The Tempest*.
B. The Spirit of Paradox in Charles Lamb's Essays.
C. Milton's Descriptions.

BOURSES DE TROISIÈME ANNÉE.

LUNDI, 16 SEPTEMBRE, 1901 :—DE 9 HEURES A MIDI.

I. *Tartuffe :*

(1) Traduire en anglais les extraits suivants, (2) en donner le contexte, (3) et expliquer les allusions qui se trouvent dans les mots soulignés :

(*a*) Oui, mais pourquoi, surtout depuis un certain temps,
Ne saurait-il souffrir qu'aucun hante céans ?
En quoi blesse le ciel une visite honnête,
Pour en faire un vacarme à nous rompre la tête ?
Veut-on que là-dessus je m'explique entre nous ?
Je crois que de madame il est, ma foi, *jaloux*.

(*b*) A votre nez, mon frère, elle se rit de vous ;
Et, sans avoir dessein de vous mettre en courroux,
Je vous dirai tout franc que c'est avec justice.
A-t-on jamais parlé *d'un semblable caprice* ?
Et se peut-il qu'un homme ait un charme aujourd'hui
A vous faire oublier toutes choses pour lui ;
Qu'après avoir chez vous *réparé sa misère*,
Vous en veniez au point ?...

(*c*) Mais quoi ! si votre père est un bourreau fieffé,
Qui s'est de son Tartuffe entièrement coiffé,
Et manque à l'union qu'il avait arrêtée,
La faute à votre amant doit-elle être imputée ?

(*d*) Oui, traître, et dès ce soir, pour vous faire enrager.
Ah ! je vous brave tous, et je vous ferai connaître
Qu'il faut qu'on m'obéisse et que je suis le maître.

Allons, *qu'on se rétracte* ; et qu'à l'instant, fripon,
On se jette à ses pieds pour lui demander pardon.

(4) Indiquer les principales occasions ou circonstances où le travers d'Orgon se manifeste.

(5) Quelle distinction Cléante fait-il entre la vraie piété et la fausse dévotion ?

(6) Faire une analyse du dénouement de Tartuffe.

(7) Molière attaque-t-il la religion dans cette comédie ? Appuyer votre réponse de preuves ou considérations.

II. *Iphigénie* :—

(1) Quelles sont les sources où Racine a puisé son *Iphigénie?*

(2) Montrer le rôle que joue l'élément religieux dans cette pièce.

(3) Faire voir, dans le cours de l'action de cette tragédie qu'Eriphile est ingrate et perfide, mais qu'elle meurt injustement.

(4) Faire l'analyse des deux caractères *Achille* et *Clytemnestre.*

(5) Rendre en anglais les expressions suivantes :

(*a*) Pour comble de malheur.

(*b*) Elle s'applaudit des bontés de son père.

(*c*) Tandis qu'à l'envi leur amour se déploie.

(*d*) Moi, toujours en butte à de nouveaux dangers.

(*e*) Aux affronts d'un refus craignant de vous commettre.

(*f*) Ces combats que vous avez rendus.

(*g*) Un bienfait reproché tient toujours lieu d'offense.

BOURSES DE TROISIÈME ANNÉE.

Lundi, 16 Septembre, 1901.—Après-Midi, de 2 à 5 Heures.

I. *Les Nuits :*

1. Traduire en anglais :—

Les morts dorment en paix dans le sein de la terre :
Ainsi doivent dormir nos sentiments éteints.
Ces reliques du cœur ont aussi leur poussière ;
Sur leurs restes sacrés ne portons pas la main.
Pourquoi, dans ce récit d'une vive souffrance,
Ne veux-tu voir qu'un rêve et qu'un amour trompé?
Est-ce donc sans motif qu'agit la Providence ?
Et crois-tu donc distrait le Dieu qui t'a frappé ?
Le coup dont tu te plains t'a préservé peut-être,
Enfant ; car c'est par là que ton cœur s'est ouvert.
L'homme est un apprenti, la douleur est son maître,
Et nul ne se connaît tant qu'il n'a pas souffert.
C'est une dure loi, mais une loi suprême,
Vieille comme le monde et la fatalité,
Qu'il nous faut du malheur recevoir le baptême,
Et qu'à ce triste prix tout doit être acheté.
Les moissons pour mûrir ont besoin de rosée ;
Pour vivre et pour sentir, l'homme a besoin de pleurs ;
La joie a pour symbole une plante brisée,
Humide encor de pluie et couverte de fleurs.

2. Décrire la mort du pélican telle que racontée dans la *Nuit de Mai*. Quelle application le poète en fait-il ?

3. Analyser la *Nuit de Décembre*. Du temps que j'étais écolier, etc.

II. *Pierre et Camille :*

Faire une analyse (de 300 mots environ) et donner une appréciation de cette nouvelle.

III. *Servitude et Grandeur militaires :*

Traiter deux des sujets suivants : (300 mots environ pour chacun.)

Histoire du cachet rouge.
La canne de jonc
La veillée de Vincennes.
Histoire de l adjudant.

IV. 1. La vie et les œuvres de Vigny ou de Musset.

2. Faire un parallèle entre l'un et l'autre de ces poètes.

3. Quels sont (*a*) *les caractères*, (*b*) *l'origine*, *et* (*c*) *le fondateur* de l'école littéraire à laquelle ces deux poètes se rattachent.

V. Traduire en français :—

A few months after the death of this minister, there occurred an event that has no parallel ; and what is not less strange is that all historians have passed it over. There was sent with the greatest secrecy to the castle of the Island of Sainte-Marguerite in the Sea of Provence, an unknown prisoner, of a stature above the common, young, and of the finest and noblest appearance. This prisoner on the way wore a mask, the chin piece of which had steel springs which left him freedom to eat with the mask on his face. They had orders to kill him if he uncovered himself. He remained on the island until a trusted officer named Saint-Mars, governor of Pignerol, having been made governor of the Bastille in 1690, went and got him at the Island of Sainte-Marguerite, and took him to the Bastille, always masked. The Marquis de Louvois went to see him on this island before the transfer, and spoke to him standing and with a politeness that bordered on respect.

GERMAN.

MONDAY, 16TH SEPTEMBER, 1901, 9 TO 12 A. M.

I. Translate :—

(1). Schiller : *Don Carlos*, act III, scene 5, first paragraph.

(2). Goethe : *Dichtung und Wahrheit* (Heath's edition), p. 52, l. 22 to p. 53, l. 5.

(3). Immermann : *Der Oberhof* (Pitt Press edition), p. 52, l. 21 to p. 53, l. 15.

(4). Meyer : *Gustav Adolf's Page* (Heath's edition) p. 23, first paragraph.

II. (1). How is *any* rendered in German as (a) an adjective; (b) a pronoun; (c) an adverb? Form sentences to illustrate your answers.

(2). Show by examples the construction required by the following verbs: *rauben, berauben, anvertrauen, sich erinnern, beschuldigen, würdigen, aussetzen, sich entäuszern.*

(3). What is the force of the prefixes *ge-* and *ur-* in nouns, and of *be-, ent-, ver- um-*, in verbs? Give examples

Give the meanings of *bestellen, entstellen, verstellen,* (literally and figuratively), *umstellen* (separable and inseparable)?

(4). Translate into English:—

(a) *jemand etwas entgelten lassen.*
(b) *jemand gewähren lassen.*
(c) *jemand den Dienst aufkündigen.*
(d) *jemandes Ansehen untergraben.*

(5). Translate into German:—

(a) How much do I owe you?
(b) It is to you I owe all my fortune.
(c) Where are you going? To the Eagle Inn.
(d) It does not matter, it is all the same to me.

GERMAN.

MAINLY TRANSLATION AT SIGHT.

MONDAY, 16TH SEPTEMBER, 1901, 2 TO 5 P. M.

I. Translate into German (at sight):—

I must have been a very simple little fellow,—Charles Darwin writes—when I first went to school. A boy of the name of Garnett took me into a cake shop one day and bought some cakes, for which he did not pay, as the shopman trusted him. When we came out I asked him why he did not pay for them and he instantly answered: "Why, do you not know that my uncle left a large sum of money to the town on condition that every tradesman should give whatever was wanted, without payment, to anyone who wore his old hat and moved it in a particular way?" and he showed me how it was to be moved. Then he said: "now, if you like to go by yourself into that shop (how well I remember its exact position), I will lend you my hat and you can get whatever you like if you move the hat properly on your head" I gladly accepted the generous offer and went in and asked for some cakes, moved the old hat and was walking out of the shop when the shopman made a rush at me, so I dropped the cakes and ran for dear life, and was astonished at being greeted with shouts of laughter by my false friend Garnett.

II. (1). Give a brief account of Goethe's life from the death of Schiller.

(2). Machen sie (auf Deutsch) eine kurze Analyse des letzten Aufzugs des "Don Carlos."

(3). What connection had Goethe and Schiller with the Storm and Stress period of German Literature?

III. Translate (at sight) various extracts from standard German authors. Texts are supplied at examination.

BOTANY.

FIRST PAPER.

SEPTEMBER, 1901.

THREE HOURS.

1. Outline, as fully as you can, the life-history of a Myxomycete, and discuss the arguments for and against the possibility of sexual reproduction.

2. Discuss the chemical and physical properties of the cell wall, its origin and purpose in the plant economy.

3. Trace the origin of the epidermal system of tissues, and show what structural modifications it undergoes in the higher types of plants.

4. Discuss the nature and sources of plant food, and indicate the special value of each element.

5. Discuss fully, the method of appropriation of food by aquatic plants and also by land plants, and show how such materials are distributed within the system.

6. Discuss, as fully as you can, the function of respiration, with special reference to a slime-mould or other protoplasmic cell, and one of the highly organized Pteridophytes.

7. Discuss fully the essential features of parasitism, saprophytism and chlorophytism, and illustrate by typical examples.

8. Detail the life-history of a fern, and explain the necessity for the special development of separate sporophyte and gametophyte as there exhibited.

9. Compare the reproductive processes of Fucus and Spirogyra; show in what essential respects they differ, and why one represents a higher type of development than the other.

BOTANY.

SECOND PAPER.

SEPTEMBER, 1901.

3 HOURS.

1. To whom are we indebted for the earliest Botanical writings? Explain the nature of the work they accomplished, and show their bearing upon the development of the Science of Botany.

2. What was the date of Cesalpino's writings? State fully what principles he endeavoured to enunciate, and the influence of his work upon the development of the Science.

3. Explain the principles of the Linnaean system of classification; show to what extent it served to explain natural relationships, and point out any features which may have survived and are now in use.

4. Discuss the "Dogma of the Constancy of Species" in its relation to the earlier systems of classification, and show how it is related to modern views of phylogeny.

5. Discuss the theory of "Metamorphosis" as expounded by Goethe, and compare this with our present views respecting the origin of the sporophyte and the laws of reversion.

6. With whom did our knowledge of plant anatomy originate, and what was the nature of their work?

7. Give a concise account of the history of our knowledge relating to the structure of the plant cell, and show what influence was exerted by Von Mohl.

8. Give a concise account of Nageli's theory of the growth of the cell-wall by intussusception, and show what modifications have been introduced by Strasburger.

9. Discuss the origin of the idea of sexuality in plants, and show what influence was exerted by Koelreuter and Sprengel.

ZOOLOGY.

FIRST PAPER.

THREE HOURS.

1. Describe carefully the mechanisms by which movement is effected in (*a*) Amoeba, (*b*) Paramoecium, (*c*) Hydra and (*d*) Lumbricus, pointing out in each case how they are related to one another.

2. Define the term "Coelom". Give its history from its first appearance in the embryo until it attains the condition found in the adult animal in (*a*) Lumbricus, (*b*) Amphioxus, (*c*) the Dog-fish.

3. Give a careful description of the heart and arterial vessels in the Dog-fish and Frog, showing how the arrangement found in the latter animal is derived from that characteristic of the former.

To what part of the blood system of the Worm can the heart and arterial vessels of a Vertebrate be compared?

4. Give a description of the structure and development of the eye of the Dog-fish, pointing out in what way the various parts of this organ are related to the ectoderm of the animal.

5. Define the terms "neuron" and "sense-cell," pointing out the resemblances and differences between these two structures.

Show, by means of a careful diagram, how the neurons and sense-cells are connected with one another in the body of the Dog-fish (excluding the head).

6. What is meant by the terms "connective tissue," "cartilage" and "bone"? Explain exactly what is meant by the term "skull," and compare the skulls of the Dog-fish and Frog, so far as they are represented by cartilage, either in the young or in the adult condition.

ZOOLOGY.

SECOND YEAR.

THREE HOURS.

1. Give Verworn's definition of an "organic individual," and sketch the train of reasoning by which he arrives at the conclusion that the "cell" satisfies this definition.

2. Give a brief account of the various kinds of granules and "formed substances" found in protoplasm.

What is the most probable view of the structure of the essential ground substance itself? Give some account of the evidence supporting this view.

3. Give an account of the various definitions of living substance which have been put forward and of Verworn's criticism of them. What definition does he finally adopt?

4 Which chemical compounds are characteristic of all protoplasm and essential for the maintenance of life? Give some evidence showing that other compounds commonly found in living substance can be formed out of this essential compound.

5. Give a list of the different kinds of movement which are effected by plants and animals. Give some examples of "passive movement."

6. Give some account of the various kinds of changes in protoplasm which usher in death.

7. Give an account of Verworn's attempt to show how all the observed movements of an Amoeba may be explained as a result of its metabolism.

Summer Readings.

FACULTY OF ARTS.

Summer Readings.
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SUMMER READINGS.

SECOND YEAR.

QUINTILIAN, BOOK X., c. 1.

FRIDAY, OCT. 25TH:—11 TO 12 A.M.

1. Translate:—

(*a*) Sed ut perveniri ad summa nisi ex principiis non potest, ita procedente iam opere minima incipiunt esse quae prima sunt. Verum nos non quo modo sit instituendus orator hoc loco dicimus (nam id quidem aut satis aut certe uti potuimus dictum est), sed athleta qui omnes iam perdidicerit a praeceptore numeros quo genere exercitationis ad certamina praeparandus sit. Igitur eum qui res invenire et disponere sciet verba quoque et eligendi et collocandi rationem perceperit instruamus qua ratione quod didicerit facere quam optime quam facillime possit.

(*b*) Sed redundat atque effunditur quod ut est reprehendendum ita copiae vitium est. Who is referred to here?

(*c*) Plenior Aeschines et magis fusus et grandiori similis, quominus strictus est; carnis tamen plus habet, minus lacertorum.

(*d*) Namque is et sermone (quod ipsum reprehendunt quibus gravitas et cothurnus et sonus Sophocli videtur esse sublimior) magis accedit oratorio generi et sententiis densus et in iis quae a sapientibus tradita sunt paene ipsis par et dicendo ac respondendo cuilibet eorum qui fuerunt in foro diserti comparandus.

2. What is Quintilian's criticism of Herodotus, Lysias, Lucan, Ennius? Quote his words where you can.

3. What do you know of the following:
Philemon, Demetrius Phalereus, Lucretius, Caecilius, Properlius, Theocritus, Callimachus.

SUMMER READINGS EXAMINATION.

SOPHOCLES, ANTIGONE

MONDAY, OCTOBER 28TH. 11 A. M.

Translate:—

(1) ἀντιτύπᾳ δ' ἐπὶ γᾷ πέσε ταναλωθεὶς
πυρφόρος, ὃς τότε μαινομένᾳ ξὺν ὁρμᾷ
βακχεύων ἐπέπνει
ῥιπαῖς ἐχθίστων ἀνέμων.
εἶχε δ' ἄλλα τὰ μέν,
ἄλλα δ' ἐπ' ἄλλοις ἐπενώμα στυφελίζων μέγας Αρης
δεξιόσειρος.

(2) χρόνον τάδ' ἦν τοσοῦτον, ἔστ' ἐν αἰθέρι
μέσῳ κατέστη λαμπρὸς ἡλίου κύκλος
καὶ καῦμ' ἔθαλπε· καὶ τότ' ἐξαίφνης χθονὸς
τυφὼς ἀείρας σκηπτόν, οὐράνιον ἄχος,
πίμπλησι πεδίον, πᾶσαν αἰκίζων φόβην
ὕλης πεδιάδος, ἐν δ' ἐμεστώθη μέγας
αἰθήρ· μύσαντες δ' εἴχομεν θείαν νόσον.

(3) οἴμοι γέλωμαι· τί με, πρὸς θεῶν πατρῴων,
οὐκ οἰκομέναν ὑβρίζεις, ἀλλ' ἐπίφαντον;
ὦ πόλις, ὦ πόλεως πολυκτήμονες ἄνδρες·
ἰὼ Δίρκαῖαι κρῆναι
Θήβας τ' εὐαρμάτου ἄλσος, ἔμπας ξυμμάρτυρας
ὕμμ' ἐπικτῶμαι
οἷα φίλων ἄκλαυτος, οἵοις νόμοις
πρὸς ἔργμα τυμβόχωστον ἔρχομαι τάφου ποταινίου.
ἰὼ δύστανος, βροτοῖς οὔτε νεκροῖς κυροῦσα
μέτοικος, οὐ ζῶσιν, οὐ θανοῦσιν.

(4) τούτων σε λωβητῆρες ὑστεροφθόροι
λοχῶσιν Ἄιδου καὶ θεῶν Ἐρινύες,
ἐν τοῖσιν αὐτοῖς τοῖσδε ληφθῆναι κακοῖς.
καὶ ταῦτ' ἄθρησον εἰ κατηργυρωμένος
λέγω· φανεῖ γὰρ οὐ μακροῦ χρόνου τριβὴ
ἀνδρῶν γυναικῶν σοῖς δόμοις κωκύματα.
ἐχθραὶ δὲ πᾶσαι συνταράσσονται πόλεις,
ὅσων σπαράγματ' ἢ κύνες καθήγνισαν
ἢ θῆρες, ἤ τις πτηνὸς οἰωνός, φέρων
ἀνόσιον ὀσμὴν ἐστιοῦχον ἐς πόλιν.
τοιαῦτα σου, λυπεῖς γὰρ, ὥστε τοξότης
ἀφῆκα θυμῷ καρδίας τοξεύματα
βέβαια, τῶν σὺ θάλπος οὐχ ὑπεκδραμεῖ.

(5) τὸν δ' ἀγρίοις ὄσσοισι παπτήνας ὁ παῖς
πτύσας πρωσώπῳ κοὐδὲν ἀντειπών, ξίφους
ἕλκει διπλοῦς κνώδοντας· ἐκ δ' ὁρμωμένου
πατρὸς φυγαῖσιν ἤμπλακ'· εἶθ' ὁ δύσμορος
αὑτῷ χολωθείς, ὥσπερ εἶχ', ἐπανταθεὶς

ἤρεισε πλευραῖς μέσσον ἔγχος· ἐς δ' ὑγρὸν
ἀγκῶν' ἔτ' ἔμφρων παρθένῳ προσπτύσσεται·
καὶ φυσιῶν ὀξεῖαν ἐκβάλλει ῥοὴν
λευκῇ παρειᾷ φοινίου σταλγάματος.

SECOND YEAR, 1901.

TUESDAY, OCTOBER 22ND, 1901, 12 M. TO 1 P.M,

LUCIAN, SOMNIUM, CHARON.

Translate:

1. καὶ τό γε πρῶτον ἐκεῖνο καὶ σύνηθες τοῖς ἀρχομένοις ἐγίγνετο ἐγκοπέα γάρ τινά μοι δοὺς ὁ θεῖος ἐκέλευσέ μοι ἠρέμα καθικέσθαι πλακὸς ἐν μέσῳ κειμένης, ἐπειπὼν τὸ κοινὸν "ἀρχὴ δέ τοι ἥμισυ παντός." σκληρότερον δὲ κατενεγκόντος ὑπ' ἀπειρίας κατεάγη μὲν ἡ πλάξ, ὁ δὲ ἀγανακτήσας σκυτάλην τινὰ πλησίον κειμένην λαβὼν οὐ πρᾴως οὐδὲ προτρεπτικῶς μου κατήρξατο, ὥστε δάκρυά μοι τὰ προοίμια τῆς τέχνης. Εν. γ΄

2. ἀφεὶς δὲ αὐτοὺς τηλικούτους καὶ τοιούτους ἄνδρας καὶ πράξεις λαμπρὰς καὶ λόγους σεμνοὺς καὶ σχῆμα εὐπρεπὲς καὶ τιμὴν καὶ δόξαν καὶ ἔπαινον καὶ προεδρίας καὶ δυνάμεις καὶ ἀρχὰς καὶ τὸ ἐπὶ λόγοις εὐδοκιμεῖν καὶ τὸ ἐπὶ συνέσει εὐδαιμονίζεσθαι χιτώνιόν τι πιναρὸν ἐνδύσῃ καὶ σχῆμα δουλοπρεπὲς ἀναλήψῃ καὶ μοχλία ἐν ταῖν χεροῖν ἕξεις κάτω νενευκὼς εἰς τὸ ἔργον, χαμαιπετὴς καὶ χαμαίζηλος καὶ πάντα τρόπον ταπεινός, ἀνακύπτων δὲ οὐδέποτε οὐδὲ ἀνδρῶδες οὐδὲ ἐλεύθερον οὐδὲν ἐπινοῶν, ἀλλὰ τὰ μὲν ἔργα ὅπως εὔρυθμα καὶ εὐσχήμονα ἔσται σοι προνοῶν, ὅπως δὲ αὐτὸς εὔρυθμος καὶ κόσμιος ἔσῃ, ἥκιστα πεφροντικώς, ἀλλ ἀτιμότερον ποιῶν σεαυτὸν λίθων. Εν. ιγ΄

3. οἶσθα, ὦ Ἑρμῆ, ἅπερ εἴωθα λέγειν ἐγὼ πρὸς ὑμᾶς, ἐπειδὰν πλέωμεν; ὁπόταν γὰρ τὸ πνεῦμα καταιγίσαν πλαγίᾳ τῇ ὀθόνῃ ἐμπέσῃ καὶ τὸ κῦμα ὑψηλὸν ἀρθῇ, τότε ὑμεῖς μὲν ὑπ' ἀγνοίας κελεύετε τὴν ὀθόνην στεῖλαι ἢ ἐνδοῦναι ὀλίγον τοῦ ποδὸς ἢ συνεκδραμεῖν τῷ πνέοντι, ἐγὼ δὲ τὴν

ἡσυχίαν ἄγειν παρακελεύομαι ὑμῖν· αὐτὸς γὰρ εἰδέναι το βέλτιον. κατὰ ταὐτὰ δὴ καὶ σὺ πρᾶττε ὁπόσα καλῶς ἔχειν νομίζεις κυβερνήτης νὺν γε ὤν· ἐγὼ δέ, ὥσπερ ἐπιβάταις νόμος, σιωπῇ καθεδοῦμαι πάντα πειθόμενος κελεύοντί σοι. Χα. γ΄

4. ἐθέλω δ' οὖν σοι, ὦ Ἑρμῆ, εἰπεῖν, ᾧτινι ἐοικέναι μοι ἔδοξαν οἱ ἄνθρωποι καὶ ὁ βίος ἅπας αὐτῶν. ἤδη ποτὲ πομφολυγας ἐν ὕδατι ἐθεάσω ὑπὸ κρουνῷ τινι καταράττοντι ἀνισταμένας; τὰς φυσαλίδας λέγω, ἀφ' ὧν ξυναγείρεται ὁ ἀφρός· ἐκείνων τοίνυν τινὲς μὲν μικραί εἰσι καὶ αὐτίκα ἐκραγεῖσαι ἀπέσβησαν, αἱ δ' ἐπὶ πλέον διαρκοῦσι καὶ προσχωρουσῶν αὐταῖς τῶν ἄλλων αὗται ὑπερφυσώμεναι ἐς μέγιστον ὄγκον αἴρονται, εἶτα μέντοι κἀκεῖναι πάντως ἐξερράγησάν ποτε· οὐ γὰρ οἷόν τε ἄλλως γενέσθαι. τοῦτό ἐστιν ὁ ἀνθρώπου βίος. ἅπαντες ὑπὸ πνεύματος ἐμπεφυσημένοι οἱ μὲν μείζους, οἱ δὲ ἐλάττους· καὶ οἱ μὲν ὀλιγοχρόνιον ἔχουσι καὶ ὠκύμορον τὸ φύσημα, οἱ δέ ἅμα τῷ ξυστῆναι ἐπαύσαντο· πᾶσι δ' οὖν ἀπορραγῆναι ἀναγκαῖον. Χα. ιθ΄

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SECOND YEAR.

MATHEMATICS.

SATURDAY OCT. 5TH:—MORNING 9 TO 12.

1. Two circles touch a given straight line at two given points and also touch one another; find the locus of their point of contact.

2. An equilateral triangle is inscribed in a circle. Prove that the square described on a side of the triangle is equal to three times the square on the radius of the circle.

3. Prove that the lines joining the vertices of a triangle to the points of contact of the inscribed circle are concurrent.

4. A pyramid is divided into two portions of equal volume by a plane parallel to the base. If the altitude of the pyramid is 1 foot, what is the distance of the plane from the apex.

5. In a parabola prove that (*a*) the parameter of the diameter through a point P on the curve equals four times the focal distance of P, (*b*) the rectangle contained by the ordinates of the extremities of a focal chord equals the square on half the latus rectum.

6. Solve (1) $\left.\begin{aligned} x^2 y + xy^2 &= 20 \\ \frac{1}{x} + \frac{1}{y} &= \frac{5}{4} \end{aligned}\right\}$

(2) $2x^2 - 2x + 2\sqrt{2x^2 - 7x + 6} = 5x - 6$

(3) $4^x + 8 = 9.2^x$

7. Show that the sum of 8 terms of the series

$$\frac{2}{3} - \frac{2}{\sqrt{3}} + 2 - \ldots\ldots \text{ is } - \frac{80\sqrt{3} - 1}{3}$$

8. The arithmetic mean of the 1st and 3rd terms of a G. P. is times the 2nd term. Find the common ratio.

9. Show that the middle term of $(1 + x)^{2n}$ is

$$\frac{(2n-1)(2n-3)\ldots\ldots 5.3.1}{\lfloor n} \, 2^n x^n$$

10. Prove that

(1) $\dfrac{\tan\theta}{\tan 2\theta - \tan\theta} = \cos 2\theta$

(2) $2\cos\theta = \pm\sqrt{1+\sin 2\theta} \pm \sqrt{1-\sin 2\theta}$

(3) Show by means of a diagram how, in the previous case, the choice of signs depends upon the value of θ.

11. In any plane triangle prove

(1) $c = (a+b)\sin\frac{1}{2}C\sec\frac{1}{2}(A-B)$

(2) $\sin\dfrac{A}{2} + \sin\dfrac{B}{2} + \sin\dfrac{C}{2}$

$= 1 + 4\sin\dfrac{B+C}{4}\sin\dfrac{A+B}{4}\sin\dfrac{C+A}{4}$.

12. In any spherical triangle prove

$$\cos A = \frac{\cos a - \cos b\cos c}{\sin b\sin c}$$

Hence deduce a rule for determining the species of the sides and angles.

13. Prove that the sides of a spherical triangle are supplementary to the angles of its polar.

THIRD AND FOURTH YEARS EXHIBITION AND PRIZE EXAMINATION.

MATHEMATICS.

SATURDAY, OCT. 5th:—Morning 9 to 12.

1. If $u = \log(x + \sqrt{x^2+y^2})$, then $x\dfrac{du}{dx} + y\dfrac{du}{dy} = 1$

*2. Find the asymptote of the curve $y^3 = x^2(a-x)$. What kind of a double point is the origin?

3. Given the curve $y(a^2+x^2) = a^2(a-x)$, find :—

(1). The asymptote.

(2). The position of the maximum and minimum ordinates.

(3). The points of inflexion.

(4). The radius of curvature where the curve crosses the axis of y

(5). The area bounded by the curve and the positive directions of the axes.

*4. The length of the normal of the catenary

$$y = \frac{a}{2}\left(e^{\frac{x}{a}} + e^{-\frac{x}{a}}\right) \text{ is } y^2/a.$$

5. Integrate (1) $\sec\theta\, d\theta$, (2) $\sec^2\theta\, d\theta$, (3) $\sec^3\theta\, d\theta$, (4) $\sec^4\theta\, d\theta$.

6. Show that the moment of inertia of a paraboloid of revolution about its geometrical axis is $m\frac{r^2}{3}$ where r is the radius of the base.

†7. Expand $e^x \sec x$ into the series $1 + x + x^2 + \frac{2}{3}x^3 + \ldots$.

†8. Find the value of $\int_0^{\frac{\pi}{2}} \sin^n\theta \, d\theta$, where n is any positive integer.

9. Prove that the semi-minor axis of an ellipse is a mean proportional between the distances of any tangent from the two foci.

10. The length of the normal of an equilateral hyperbola is equal to the distance of the point of contact from the centre.

11. The locus of the foot of the perpendicular from the vertex of the parabola $y^2 = 4px$ on the tangent is the curve $y^2 = -\frac{x^3}{x+p}$.

*12. Find the equation of the circle whose diameter is the common chord of the circles $x^2 + y^2 = r^2$, $(x - a)^2 + y^2 = r^2$.

†13. Find the centre of the conic $4x^2 - 24xy - 3y^2 + 24y - 4 = 0$, and show that the principal axes make an angle $\tan^{-1}\frac{4}{3}$ with the co-ordinate axes.

*14. The acceleration of the weights of an Atwood machine $= \left(\frac{m_1 - m_2}{m_1 + m_2}\right)g$.

†15. The acceleration of the centre of gravity of the weights of an Atwood machine $= \left(\frac{m_1 - m_2}{m_1 + m_2}\right)^2 g$, the mass of the pulley being neglected.

*16. The elevation of the outer rail of a railway track $= 7v^2/4r$ inches for standard gauge 4 ft. 8½ in.

†17. The weight of a train is 95½ tons. Find the energy required to bring the train from rest to a speed of 25 miles per hour.

Also the H. P. required to maintain this speed, the drawbar pull being 6 pounds per ton.

SCOTT EXHIBITION.

EXAMINATION ON THE SUMMER READINGS IN ENGLISH.

WEDNESDAY, OCTOBER 2ND—2 TO 5 P.M.

Candidates are recommended to pay attention to the form, as well as the matter, of their answers. Composition and spelling will be taken into account, along with knowledge of the books, in determining the result.

Candidates take A, B, C, and either D or E. Only eight questions are to be attempted.

A.—SCOTT: *Waverley.*

1. Describe any Scottish customs or traits of character brought forward in this novel.

2. What do you think of the character of the hero?

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* For Third Year only.

† For Fourth Year only.

B.—GOLDSMITH: *The Vicar of Wakefield.*

3. Analyse the character of Sir William Thornhill.

4. What moral lessons may be drawn from the story?

C.—SPECTATOR: *Selections.*

5. How do the Spectator essays differ from the newspaper articles of the present day?

6. Mention any particulars of the life of the time to be gathered from the essays you have read.

D.—SHAKSPERE: *Richard II.*

7. Give in your own words the course of the play after Bolingbroke's return to England.

8. Contrast the characters of Richard II and Bolingbroke.

E.—SHAKSPERE: *The Tempest.*

9. Tell in your own words the story of Prospero.

10. Contrast the characters of Ariel and Caliban.

SCOTT EXHIBITION EXAMINATION.

SECOND YEAR.

DESCRIPTIVE GEOMETRY.

TUESDAY, OCT. 8, 2 TO 5 PM.

1. A square prism 4 in. long, edge of end 2″, rests on the *H.P.* on a point 1½ in. from the *V. P.* One diagonal of the end is horizontal and the long edges of the prism are at 35° to the *H. P.* and 25° to the *V. P.* A cylinder 4 in. long, 1¾ in. dia., stands vertically on the *H.P.* so that its axis passes through the axis of the prism at a point one-third from its upper end. Show the elevation of the interpenetration lines.

2. A triangle *ABC*—*AB* 2″ *BC* 1¾″, *AC* 2¼″, has its angles *A* 1½ in., *B* 1¼ in. and *C* 1¾ in. above the *HP.* This triangle is the end of a right prism 3 in. long. Show plan of the prism and an elevation on a plane parallel to the edge *AB*.

3. A right hexagonal pyramid has one edge of the base in the *V. P.* at 40° to the *H. P.* and the plane of the base is at 40° to the *V. P.* Show plan and elevation of the pyramid. Length of edge of base 1½ in., length of slant edge 3 in.

Ques. 4. Show plan and elevation of a tetrahedron when one edge is horizontal, $\frac{1}{2}$ in. above *H.P.* and at 70° to the *V.P.*, and a face adjacent to it is at 25° to the *H. P.* Edge $2\frac{1}{2}$ in.

SUMMER READING.

(Pour les étudiants Français).

1901.

A. Corneille :

I. *Le Cid :*

(*a*) D'où Corneille a-t-il tiré ce sujet ? (*b*) Quelles circonstances firent de cette tragédie un grand événement littéraire ?

(*c*) Faites une courte analyse de cette tragédie, en faisant surtout ressortir la cause et l'issue des trois combats de Rodrigue.

2. *Horace :*

(*a*) Quel est le sujet d'Horace ? (*b*) Quelles sont les *passions* qui forment les ressorts de l'action dans cette tragédie ? (*c*) Comparez le caractère de Curiace, le fiancé de Camille, avec celui d'Horace, le mari de Sabine. (*d*) " Qu'il mourût : " Caractérisez ces paroles ; qui les prononça ? à qui s'adressent-elles ? Indiquez-en le contexte et la place quelles occupent dans l'action de la tragédie.

B. V. Hugo :

1. *Ruy Blas :*

(*a*) De quel moyen don Saluste se sert-il pour se venger ? (*b*) A quoi aboutit sa vengeance ? (*c*) Donnez le contexte des extraits suivants et indiquez la place qu'ils occupent dans l'action du drame :

(1) Charles-Quint ! dans ces temps d'opprobre et de terreur,
Que fais-tu dans ta tombe, O puissant empereur!
Oh lève-toi ! viens voir !

(2) Il n'est plus temps.
Madame de Neubourg n'est plus reine d'Espagne.

(3) Je dis que je me nomme
Ruy Blas, et que je suis le laquais de cet homme !

2. *Hernani :*

(*a*) Faites l'analyse du rôle de don Carlos. (*b*) Quel est le dénouement de ce drame ?

3. Quels étaient les principes du romantisme sur la littérature en général et sur le drame en particulier ?

C. Balzac :

1. Donnez un aperçu de sa vie.

2. A quell école littéraire cet écrivain appartient-il ? Quel rôle y a t-il joué ? Quels sont les principaux caractères de cette école ? Nommez-en quelques autres représentants.

3. Faites une appréciation d'*Eugène Grandet.*

BRITISH ASSOCIATION EXHIBITION.

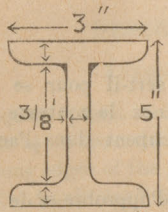
THEORY OF STRUCTURES AND STRENGTH OF MATERIALS.

OCTOBER, 1901.

1. Prove the Rankine-Gordon formula for the strength of a column in the form

$$p = \frac{f}{1 + a \frac{l^2}{r^2}}$$

and explain how the constant "a" differs according to the fixing of the ends.



Calculate the safe load on an I beam column of the given section 6 feet in length from the formula.

$$p = \frac{10{,}000}{1 + \frac{(12\ l)^2}{36{,}000\ r^2}}$$

where l = length in feet
r = least radius of gyration in inches.

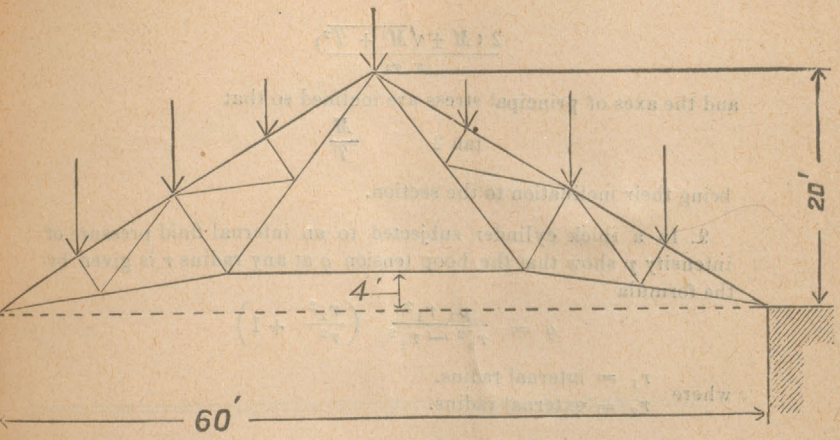
2. In a built up girder, 10 feet long between centres of bearing plates, the two flanges are equal and each consists of two $4'' \times 4'' \times \frac{1}{2}''$ angle irons connected to a $12'' \times \frac{3}{8}''$ web.

Calculate the safe distributed load the girder will carry when the maximum allowable stress is 10,000 pounds per square inch.

3. What are the advantages of using hollow propeller shafts ?

Find the size of a hollow shaft to transmit 9,000 H.P. at 120 revolutions per minute, the external diameter to be twice the internal diameter and the maximum shearing stress 8,000 lbs. per square inch.

4. A roof truss of the form shown in the Fig. has the main rafters divided equally by struts perpendicular thereto and is loaded at each point with a weight of 6,000 pounds.



Determine the stresses in all the members and indicate the members in compression by thick lines.

5. If a body be under the action of principal stresses p and q, show that on any plane inclined at an angle θ to the direction of major principal stress the intensity of stress is the resultant of two stresses, one of the value $\frac{p+q}{2}$ normal to the plane, and the other of the value $\frac{p-q}{2}$ and inclined at an angle 2θ.

6. Show that the deflection y of a beam at any point is given by the formula

$$\frac{d^2y}{dx^2} = \frac{M}{EI}$$

very approximately and explain clearly the nature of the approximation.

Deduce the formula

$$y = \frac{WL^3}{48\,EI}$$

for the case of a beam of length 1, loaded at the centre with a weight W.

7. Enunciate and prove the theorem of three moments for the case where all the supports are on the same level and each span is uniformly loaded.

8. In a circular shaft subjected to a bending moment M and twisting moment T, show that the principal stresses are given by the values

$$\frac{2\,(M \pm \sqrt{M^2 + T^2})}{\pi\, r^3}$$

and the axes of principal stress are inclined so that

$$\tan 2 \qquad \frac{M}{T}$$

being their inclination to the section.

9. In a thick cylinder subjected to an internal fluid pressure of intensity p show that the hoop tension q at any radius r is given by the formula

$$q = \frac{p_1 r_1^2}{r_2^2 - r_1^2} \left(\frac{r_2^2}{r^2} + 1\right)$$

where r_1 = internal radius.
r_2 = external radius.

10. In masonry structures of rectangular form, the line of action of the resultant stress at any joint should lie within the middle third.

Show why this rule is necessary and how it may be derived from a consideration of the formula representing the stresses in a body subjected to direct stress and bending.

11. Write a short essay on the effect of repeated stresses upon the strength of materials and the various formulæ which have been proposed to represent the results of experiment.

Sessional Examinations

FACULTY OF ARTS

1902.

Regional Engineering College Library

CLASSICAL LITERATURE AND HISTORY.

FIRST YEAR.

GREEK AUTHORS.

THURSDAY, APRIL 3RD:—MORNING, 9 TO 12.

(Answers to A., B. and C. are to be written in separate books.)

A. HOMER, ILIAD XXII.

1. Translate, with notes on words and phrases underlined:—

(*a*) πρὸς δ' ἐμὲ τὸν δύστηνον ἔτι φρονέοντ' ἐλέησον,
δύσμορον, ὅν ῥα πατὴρ Κρονίδης ἐπὶ γήραος οὐδῷ
αἴσῃ ἐν ἀργαλέῃ φθίσει, κακὰ πόλλ' ἐπιδόντα,
υἷας τ' ὀλλυμένους, ἑλκηθείσας τε θύγατρας
καὶ θαλάμους κεραιζομένους, καὶ νήπια τέκνα
βαλλόμενα προτὶ γαίῃ ἐν αἰνῇ δηιοτῆτι,
ἑλκομένας τε νυοὺς ὀλοῇς ὑπὸ χερσὶν Ἀχαιῶν.

(*b*) ἠύτε κίρκος ὄρεσφιν, ἐλαφρότατος πετεηνῶν,
ῥηιδίως οἴμησε μετὰ τρήρωνα πέλειαν·
ἡ δέ θ' ὕπαιθα φοβεῖται, ὁ δ' ἐγγύθεν ὀξὺ λεληκὼς
ταρφὲ' ἐπαίσσει, ἐλέειν τέ ἑ θυμὸς ἀνώγει.
ὣς ἄρ' ὅ γ' ἐμμεμαὼς θὺς πέτετο. τρέσε δ' Ἕκτωρ
τεῖχος ὕπο Τρώων, λαιψηρὰ δὲ γούνατ' ἐνώμα.

(*c*) οὐδ' εἴ κεν δεκάκις τε καὶ εἰκοσινήριτ' ἄποινα
στήσωσ' ἐνθάδ' ἄγοντες, ὑπόσχωνται δὲ καὶ ἄλλα,
οὐδ' εἴ κεν σ' αὐτὸν χρυσῷ ἐρύσασθαι ἀνώγοι
Δαρδανίδης Πρίαμος, οὐδ' ὧς σέ γε πότνια μήτηρ
ἐνθεμένη λεχέεσσι γοήσεται, ὃν τέκεν αὐτή,
ἀλλὰ κύνες τε καὶ οἰωνοὶ κατὰ πάντα δάσονται.

(*d*) ἤριπε δ' ἐξοπίσω. ἀπὸ δὲ ψυχὴν ἐκάπυσσεν.
τῆλε δ' ἀπὸ κρατὸς βάλε δέσματα σιγαλόεντα,
ἄμπυκα κεκρύφαλόν τε ἰδὲ πλεκτὴν ἀναδέσμην
κρήδεμνόν θ', ὅ ῥά οἱ δῶκε χρυσείη, Ἀφροδίτη,

ἤματι τῷ ὅτε μιν κορυθαίολος ἠγάγεθ' Ἕκτωρ
ἐκ δόμου Ἠετίωνος, ἐπεὶ πόρε μυρία ἕδνα.

2. Analyse the forms :—ἤμβροτες, ἀνέρα, ἐικυῖα, κατατεθνηῶτος, ἐπέφνομεν.

3. (*a*) Explain the origin of the construction known as the Genitive of Price.

(*b*) What is meant by the term "Internal Accusative."

(*c*) Explain and analyse, with an example, the "Imperatival Infinitive."

(*d*) Contrast the Homeric and Attic uses of ἂν (κεν).

B. EURIPIDES, ALCESTIS.

I. Translate, with notes on words underlined :—

(1) οὐ γάρ σ' ἔγωγε τῇδ' ἐμῇ θάψω χερί·
τέθνηκα γὰρ δὴ τοὐπὶ σ'· εἰ δ' ἄλλου τυχὼν
σωτῆρος αὐγὰς εἰσορῶ, κείνου λέγω
καὶ παῖδά μ' εἶναι καὶ φίλον γηροτρόφον.
μάτην ἄρ' οἱ γέροντες εὔχονται θανεῖν,
γῆρας ψέγοντες καὶ μακρὸν χρόνον βίου·
ἦν δ' ἐγγὺς ἔλθῃ θάνατος, οὐδεὶς βούλεται
θνῄσκειν, τὸ γῆρας δ' οὐκέτ' ἔστ' αὐτοῖς βαρύ.

Mss. τῇδ' ἐμῇ. Suggested reading τῇδε μὴ.

(2) Μόνας δ' οὔτ' ἐπὶ βωμοὺς
ἐλθεῖν οὔτε βρέτας θεᾶς
ἔστιν, οὐ σφαγίων κλύει.
μή μοι, πότνια, μείζων
ἔλθοις ἢ τὸ πρὶν ἐν βίῳ.
καὶ γὰρ Ζεὺς ὅ τι νεύσῃ,
σὺν σοὶ τοῦτο τελευτᾷ.
καὶ τὸν ἐν Χαλύβοις δαμάζεις σὺ βίᾳ σίδαρον,
οὐδέ τις ἀποτόμου λήματός ἐστιν αἰδώς.

(3) πολλῷ δὲ μόχθῳ χεῖρας ἦλθεν εἰς ἐμάς·
ἀγῶνα γὰρ πάνδημον εὑρίσκω τινὰς
τιθέντας, ἀθληταῖσιν ἄξιον πόνον,
ὅθεν κομίζω τήνδε νικητήρια
λαβών· τὰ μὲν γὰρ κοῦφα τοῖς νικῶσιν ἦν

ἵππους ἄγεσθαι, τοῖσι δ' αὖ τὰ μείζονα
νικῶσι, πυγμὴν καὶ πάλην, βουφόρβια·
γυνὴ δ' ἐπ' αὐτοῖς εἶπετ'· ἐντυχόντι δὲ
αἰσχρὸν παρεῖναι κέρδος ἦν τόδ' εὐκλεές.
ἀλλ', ὥσπερ εἶπον, σοὶ μέλειν γυναῖκα χρή·
οὐ γὰρ κλοπαίαν, ἀλλὰ σὺν πόνῳ λαβὼν
ἥκω· χρόνῳ δὲ καὶ σύ μ' αἰνέσεις ἴσως.

(3) ΑΔ. κείνην ὅπουπερ ἔστι τιμᾶσθαι χρεών.
ΗΡ. αἰνῶ μὲν αἰνῶ· μωρίαν δ' ὀφλισκάνεις.
ΑΔ. ὡς μήποτ' ἄνδρα τόνδε νυμφίον καλῶν.
ΗΡ. ἐπῄνεσ' ἀλόχῳ πιστὸς οὕνεκ' εἶ φίλος.
ΑΔ. θάνοιμ' ἐκείνην καίπερ οὐκ οὖσαν προδούς.
ΗΡ. δέχου νυν εἴσω τήνδε γενναίων δόμων.
ΑΔ. μή, πρός σε τοῦ σπείραντος ἄντομαι Διός.
ΗΡ. καὶ μὴν ἁμαρτήσει γε μὴ δράσας τάδε.
ΑΔ. καὶ δρῶν γε λύπῃ καρδίαν δηχθήσομαι.
ΗΡ. πιθοῦ· τάχ' ἂν γὰρ ἐς δέον πέσοι χάρις.

(5) ΗΡ. Οὗτος, τί σεμνὸν καὶ πεφροντικὸς βλέπεις;
οὐ χρὴ σκυθρωπὸν τοῖς ξένοις τὸν πρόσπολον
εἶναι, δέχεσθαι δ' εὐπροσηγόρῳ φρενί.

(6) ΑΛ. ἀρκοῦμεν ἡμεῖς οἱ προθνῄσκοντες σέθεν.
ΑΔ. ὦ δαῖμον, οἵας συζύγου μ' ἀποστερεῖς.
ΑΛ. καὶ μὴν σκοτεινὸν ὄμμα μου βαρύνεται.
ΑΔ. ἀπωλόμην ἄρ', εἴ με δὴ λείψεις, γύναι.
ΑΛ. ὡς οὐκέτ' οὖσαν οὐδὲν ἂν λέγοις ἐμέ.

II. Write the principal parts of: —

θάψω, εὔχονται, παρεῖναι, ἐπῄνεσ', δηχθήσομαι, πιθοῦ, πεφροντικός.

C. PLATO, CRITO.

Translate, with notes on words and phrases underlined: —

(a) εἰ γὰρ ὤφελον, ὦ Κρίτων, οἷοι τ' εἶναι οἱ πολλοὶ τὰ μέγιστα κακὰ ἐργάζεσθαι, ἵνα οἷοι τ' ἦσαν καὶ ἀγαθὰ τὰ μέγιστα, καὶ καλῶς ἂν εἶχεν· νῦν δὲ οὐδέτερα οἷοί τε· οὔτε γὰρ φρόνιμον οὔτε ἄφρονα δυνατοὶ ποιῆσαι, ποιοῦσι δὲ τοῦτο ὅ τι ἂν τύχωσι.

(*b*) ἃς δὲ σὺ λέγεις τὰς σκέψεις περί τε ἀναλώσεως χρημάτων καὶ δόξης καὶ παίδων τροφῆς, μὴ ὡς ἀληθῶς ταῦτα, ὦ κρίτων, σκέμματα ᾖ τῶν ῥᾳδιώς ἀποκτιννύντων καὶ ἀναβιωσκομένων γ' ἄν, εἰ οἷοι τ' ἦσαν, οὐδένι ξὺν νῷ, τούτων τῶν πολλῶν.

(*c*) ἦ οὕτως εἶ σοφός, ὥστε λέληθέν σε, ὅτι μητρός τε καὶ πατρὸς καὶ τῶν ἄλλων προγόνων ἁπάντων τιμιώτερον ἐστιν ἡ πατρὶς καὶ σεμνότερον καὶ ἁγιώτερον καὶ ἐν μείζονι μοίρᾳ καὶ παρὰ θεοῖς καὶ παρ' ἀνθρώποις τοῖς νοῦν ἔχουσι, καὶ σέβεσθαι δεῖ καὶ μᾶλλον ὑπείκειν καὶ θωπεύειν πατρίδα χαλεπαίνουσαν ἢ πατέρα, καὶ ἢ πείθειν ἢ ποιεῖν ἃ ἂν κελεύῃ.

(*d*) ἐκεῖ γὰρ δὴ πλείστη ἀταξία καὶ ἀκολασία, καὶ ἴσως ἂν ἡδέως σου ἀκούοιεν, ὡς γελοίως ἐκ τοῦ δεσμωτηρίου ἀπεδίδρασκες σκεύην τέ τινα περιθέμενος ἢ διφθέραν λαβὼν ἢ ἄλλα οἷα δὴ εἰώθασιν ἐνσκευάζεσθαι οἱ ἀποδιδράσκοντες, καὶ τὸ σχῆμα τὸ σαυτοῦ μεταλλάξας.

FIRST YEAR.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

THURSDAY, APRIL 3RD:—AFTERNOON 2–4.30.

1. Translate into Greek:—
   - (*a*) I do not think that those who then fled from the city are wise.
   - (*b*) He commanded the same generals to return home.
   - (*c*) When he had said this he departed, wishing to make peace on condition of leading away his soldiers.
   - (*d*) I sent messengers to tell you that we had won the victory.
   - (*e*) I knew that you had given him the books which I formerly used.
   - (*f*) They perceived that the ships were not far distant from the land.

(*g*) Shall we remain, or shall we at once attack the enemy?

(*h*) If you had been present you would have been too courageous to retreat.

(*i*) If you see him tell him the king put to death all the prisoners.

(*k*) If he drove out those traitors he acted most wisely.

2. Translate into English :—

ἤδη δὲ Μανίας, ἢ ταύτης τῆς χώρας ἐβασίλευε, οὔσης ἐτῶν πλέον ἢ τετταράκοντα, Μειδίας, θυγατρὸς ἀνὴρ αὐτῆς ὤν, αἰσχρὸν νομίζων εἶναι γυναῖκα μὲν ἄρχειν, αὐτὸν δὲ ἰδιώτην εἶναι, ἐπεβούλευσεν. τοὺς μὲν οὖν ἄλλους φυλαττομένης αὐτῆς, ὥσπερ ἐν τυραννίδι προσῆκεν, ἐκείνῳ δὲ πιστευούσης καὶ φιλούσης ὥσπερ ἂν γυνὴ γαμβρὸν φιλοίη, εἰσελθὼν ἀποπνῖξαι αὐτὴν λέγεται. ἀπέκτεινε δὲ καὶ τὸν υἱὸν αὐτῆς, τό τε εἶδος ὄντα πάγκαλον καὶ ἐτῶν ὄντα ὡς ἑπτακαίδεκα. ταῦτα δὲ ποιήσας Σκῆψιν καὶ Γέργιθα ἐχυρὰς πόλεις κατέσχεν, ἔνθα καὶ τὰ χρήματα μάλιστα ἦν τῇ Μανίᾳ· αἱ δὲ ἄλλαι πόλεις οὐκ ἐδέχοντο αὐτὸν, ἀλλὰ Φαρναβάζῳ ἔσῳζον αὐτὰς οἱ ἐνόντες φρουροί.

FIRST YEAR.

GREEK HISTORY.

THURSDAY, APRIL 3RD :—AFTERNOON, 4.30 TO 5.30.

1. In connection with the Ionic Revolt, write briefly on (*a*) the causes: the influence on the revolt, of Persian rule, as compared with Lydian; the character of the Asiatic Greeks; the influence of Miltiades, Aristagoras, Histiaios and the dynasty of the Peisistratids.

(*b*) The chief events with dates.

2. Describe the events connected with the following names: Gorgo, Artaphernes, Plataea, Ladê.

3. With what events are the names of Miltiades and Hippias associated?

4. With regard to the Delian Confederacy state:

(*a*) Historical precedents.

(*b*) General causes.

(*c*) Events leading to it.

(*d*) The probable organizer.

SECOND YEAR.

GREEK AUTHORS.

THURSDAY, APRIL 3RD:—MORNING, 9 TO 12.

(*Answers to A, B and C are to be written in separate books.*)

A.—SOPHOCLES, ELECTRA.

1. Translate, with notes on words and phrases underlined:—

(*a*) οὗτοι σοὶ μούνᾳ, τέκνον, ἄχος ἐφάνη βροτῶν,
πρὸς ὅ τι σὺ τῶν ἔνδον εἶ περισσα,
οἷς ὁμόθεν εἶ καὶ γονᾷ ξύναιμος,
οἵα Χρυσόθεμις ζώει καὶ Ἰφιάνασσα.
κρυπτᾷ τ' ἀχέων ἐν ἥβᾳ,
ὄλβιος, ὃν ἁ κλεινὰ
γᾶ ποτὲ Μυκηναίων
δέξεται εὐπατρίδαν, Διὸς εὔφρονι
βήματι μολόντα τάνδε γᾶν Ὀρέσταν.

(*b*) ἀλλὰ ταῦτα μὲν μέθες· σὺ δὲ
τεμοῦσα κρατὸς βοστρύχων ἄκρας φόβας
κἀμοῦ ταλαίνης, σμικρὰ μὲν τάδ', ἀλλ' ὅμως
ἄχω, δὸς αὐτῷ, τήνδ' ἀλιπαρῆ τρίχα
καὶ ζῶμα τοὐμὸν οὐ χλιδαῖς ἠσκημένον.
αἰτοῦ δὲ προσπίτνουσα γῆθεν εὐμενῆ
ἡμῖν ἀρωγὸν αὐτὸν εἰς ἐχθροὺς μολεῖν,
καὶ παῖδ' Ὀρέστην ἐξ ὑπερτέρας χερὸς
ἐχθροῖσιν αὐτοῦ ζῶντ' ἐπεμβῆναι ποδί,
ὅπως τὸ λοιπὸν αὐτὸν ἀφνεωτέραις
χερσὶ στέφωμεν, ἢ τανῦν δωρούμεθα.
οἶμαι μὲν οὖν, οἶμαι τι κἀκείνῳ μέλον
πέμψαι τάδ' αὐτῇ δυσπρόσοπτ' ὀνείρατα.

(*c*) καί νιν πυρᾷ κέαντες εὐθὺς ἐν βραχεῖ
χαλκῷ μέγιστον σῶμα δειλαίας σποδοῦ
φέρουσιν ἄνδρες Φωκέων τεταγμένοι,
ὅπως πατρῴας τύμβον ἐκλάχῃ χθονός.

(Mss. ἐκλάχοι).

(*d*) ὦ χθονία βροτοῖσι φάμα,
κατά μοι βόασον οἴκτρὰν
ὅπα τοῖς ἔνερθ' Ατρείδαις.
ἀχόρευτα φέρουσ' ὀνείδη·
ὅτι σφὶν ἤδη τὰ μὲν ἐκ δόμων νοσεῖ
δή, τὰ δὲ πρὸς τέκνων διπλῆ
φύλοπις οὐκέτ' ἐξισοῦται
φιλοτασίῳ διαίτᾳ.
πρόδοτος δὲ μόνα σαλεύει
Ἠλέκτρα, τὸν ἀεὶ πατρὸς
δειλαία στενάχουσ', ὅπως
ἁ πάνδυρτος ἀηδών.

(*e*) ΗΛ. ἔξοιδα· πῶς γὰρ οὐχί; συμφορᾶς γὰρ ἂν
ἔξωθεν εἴην τῶν ἐμῶν τῆς φιλτάτης.
ΑΙΓ. ποῦ δῆτ' ἂν εἶεν οἱ ξένοι; δίδασκέ με.
ΗΛ. ἔνδον· φίλης γὰρ προξένου κατήνυσαν.

2. Translate and comment on:—

(*a*) ὡς κἄμ' ἐπαυχῶ τῆσδε τῆς φήμης ἄπο
δεδορκότ' ἐχθροῖς ἄστρον ὣς λάμψειν ἔτι.

(*b*) οἶδα τε καὶ ξυνίημι τάδ'. οὔ τί με
φυγγάνει· οὐδ' ἐθέλω προλιπεῖν τάδε
μὴ οὐ τὸν ἐμὸν στενάχειν πατέρ' ἄθλιον.

(*c*) νῦν δ' ἐν κακοῖς μοι πλεῖν ὑφειμένῃ δοκεῖ,
καὶ μὴ δοκεῖν μὲν δρᾶν τι, πημαίνειν δὲ μή.

(*d*) πεπαύμεθ' ἡμεῖς, οὐχ ὅπως σε παύσομεν.

(*e*) ΟΡ. τίς γὰρ σ' ἀνάγκη τῇδε προτρέπει βροτῶν;
ΗΛ. μήτηρ καλεῖται, μητρὶ δ' οὐδὲν ἐξισοῖ.

3. Discuss the following Ms. readings:—

(*a*) δρόμου δ' ἰσώσας τῇ φύσει τὰ τέρματα
νίκης ἔχων ἐξῆλθε πάντιμον γέρας.

(*b*) ἀλλ' οὔ τι μὴν ἔγωγε τοὐ λοιποῦ χρόνου
ξύνοικος ἔσσομ' ἀλλὰ τῇδε πρὸς πύλῃ
παρεῖσ' ἐμαυτὴν ἄφιλος αὐανῶ βίον.

(*c*) εἴθ' ὤφελες τοιάδε τὴν γνώμην πατρὸς
θνήσκοντος εἶναι· πάντα γὰρ κατειργάσω.

(*d*) ΚΛ. ὤμοι μάλ' αὖθις. ΗΛ. εἰ γὰρ Αἰγίσθῳ θ' ὁμοῦ

B.—Thucydides.

Translate with notes on words underlined:—

(*a*) ἀφικομένων δὲ τῶν ἀνδρῶν καὶ τοῦ Σαλαίθου οἱ Ἀθηναῖοι τὸν μὲν Σάλαιθον εὐθὺς ἀπέκτειναν, ἔστιν ἃ παρεχόμενον τά τ' ἄλλα καὶ ἀπὸ Πλαταιῶν (ἔτι γὰρ ἐπολιορκοῦντο) ἀπάξειν Πελοποννησίους· περὶ δὲ τῶν ἀνδρῶν γνώμας ἐποιοῦντο, καὶ ὑπὸ ὀργῆς ἔδοξεν αὐτοῖς οὐ τοὺς παρόντας μόνον ἀποκτεῖναι, ἀλλὰ καὶ τοὺς ἅπαντας Μυτιληναίους ὅσοι ἡβῶσι, παῖδας δὲ καὶ γυναῖκας ἀνδραποδίσαι, ἐπικαλοῦντες τήν τε ἄλλην ἀπόστασιν καὶ ὅτι οὐκ ἀρχόμενοι ὥσπερ οἱ ἄλλοι ἐποιήσαντο, καὶ προσξυνεβάλετο οὐκ ἐλάχιστον τῆς ὁρμῆς αἱ Πελοποννησίων νῆες ἐς Ἰωνίαν ἐκείνοις βοηθοὶ τολμήσασαι παρακινδυνεῦσαι.

(*b*) τῶν τε ξυμμάχων σκέψασθε εἰ τοῖς τε ἀναγκασθεῖσιν ὑπὸ τῶν πολεμίων καὶ τοῖς ἑκοῦσιν ἀποστᾶσι τὰς αὐτὰς ζημίας προσθήσετε, τίνα οἴεσθε ὄντινα οὐ βραχείᾳ προφάσει ἀποστήσεσθαι, ὅταν ἢ κατορθώσαντι ἐλευθέρωσις ᾖ ἢ σφαλέντι μηδὲν παθεῖν ἀνήκεστον; ἡμῖν δὲ πρὸς ἑκάστην πόλιν ἀποκεκινδυνεύσεται τά τε χρήματα καὶ αἱ ψυχαί, καὶ τυχόντες μὲν πόλιν ἐφθαρμένην παραλαβόντες τῆς ἔπειτα προσόδου, δι' ἣν ἰσχύομεν, τὸ λοιπὸν στερήσεσθε, σφαλέντες δὲ πολεμίους πρὸς τοῖς ὑπάρχουσιν ἕξομεν, καὶ ὃν χρόνον τοῖς νῦν καθεστηκόσι δεῖ ἐχθροῖς ἀνθίστασθαι, τοῖς οἰκείοις ξυμμάχοις πολεμήσομεν.

(*c*) καὶ τούτου ὃ μάλιστα Κλέων ἰσχυρίζεται, ἐς τὸ λοιπὸν ξυμφέρον ἔσεσθαι πρὸς τὸ ἧσσον ἀφίστασθαι θάνατον ζημίαν προθεῖσι, καὶ αὐτὸς περὶ τοῦ ἐς τὸ μέλλον καλῶς ἔχοντος ἀντισχυριζόμενος τἀναντία γιγνώσκω. καὶ οὐκ ἀξιῶ ὑμᾶς τῷ εὐπρεπεῖ τοῦ ἐκείνου λόγου τὸ χρήσιμον τοῦ ἐμοῦ ἀπώσασθαι. δικαιότερος γὰρ ὢν αὐτοῦ ὁ λόγος πρὸς τὴν νῦν ὑμετέραν ὀργὴν ἐς Μυτιληναίους τάχα ἂν ἐπισπάσαιτο. ἡμεῖς δὲ οὐ δικαζόμεθα πρὸς αὐτούς, ὥστε τῶν δικαίων δεῖν, ἀλλὰ βουλευόμεθα περὶ αὐτῶν, ὅπως χρησίμως ἕξουσιν.

Mss. τοῦτο ὃ.

(*d*) ὥστε εἴ τῳ δοκοῦμεν ἀδικεῖν προαποστάντες διὰ τὴν ἐκείνων μέλλησιν τῶν ἐς ἡμᾶς δεινῶν, αὐτοὶ οὐκ

ἀνταναμείναντες σαφῶς εἰδέναι εἴ τι αὐτῶν ἔσται, οὐκ ὀρθῶς σκοπεῖ. εἰ γὰρ δυνατοὶ ἦμεν ἐκ τοῦ ἴσου καὶ ἀντεπιβουλεῦσαι, καὶ ἀντιμελλῆσαί τι ἔδει ἡμᾶς ἐκ τοῦ ὁμοίου ἐπ' ἐκείνοις ἰέναι;

(*e*) εἰ τὸ αὐτὸ δύναται σχολῇ καὶ ταχὺ ξυμβῆναι.

C.—Odyssey IX.

Translate, with brief notes on words underlined:—

(1) ἐλθόντες δ' εἰς ἄντρον ἐθηεύμεσθα ἕκαστα·
ταρσοὶ μὲν τυρῶν βρίθον, στείνοντο δὲ σηκοὶ
ἀρνῶν ἠδ' ἐρίφων· διακεκρίμεναι δὲ ἕκασται
ἔρχατο, χωρὶς μὲν πρόγονοι, χωρὶς δὲ μέτασσαι,
χωρὶς δ' αὖθ' ἕρσαι· ναῖον δ' ὀρῷ ἄγγεα πάντα,
γαυλοί τε σκαφίδες τε, τετυγμένα, τοῖς ἐνάμελγεν.
ἐνθ' ἐμὲ μὲν πρώτισθ' ἕταροι λίσσοντ' ἐπέεσσιν
τυρῶν αἰνυμένους ἰέναι πάλιν.

(2) ἦκε δ' ἀπορρήξας κορυφὴν ὄρεος μεγάλοιο,
κὰδ δ' ἔβαλε προπάροιθε νεὸς κυανοπρώροιο.
ἐκλύσθη δὲ θάλασσα κατερχομένης ὑπὸ πέτρης·
τὴν δ' αἶψ' ἠπειρόνδε παλιρρόθιον φέρε κῦμα,
πλημυρὶς ἐκ πόντοιο, θέμωσε δὲ χέρσον ἱκέσθαι.
αὐτὰρ ἐγὼ χείρεσσι λαβὼν περιμήκεα κοντὸν
ὦσα παρέξ· ἑτάροισι δ' ἐποτρύνας ἐκέλευσα
ἐμβαλέειν κώπῃς, ἵν' ὑπὲκ κακότητα φύγοιμεν.

SECOND YEAR.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

Thursday, April 3rd:—Afternoon, 2 to 4.30.

1. Translate into Greek:—

The judges of the Turkoi, when they hear evidence, pay more attention to those who say that a thing has been done, than to those who prove most clearly that nothing of the sort took place. And one of the Angloi, who was living in that country, was accused by a Turkos of having received ten jars of wine and not having paid for them. Though he had not had the wine and indeed

had never seen the man before, the Turkos said he would bring forward twelve witnesses to prove that what he said was true; so the Anglos, before doing anything to defend himself, took counsel with his brother, who had lived longer in the country and knew their customs better. And he said that it was no use to deny the charge, but promised to provide him with twenty-four witnesses to swear that he really had paid the money. And when the case was tried, he actually won by this plan.

2. Translate into English:—

(*a*) *οἱ δ' Ἀθηναῖοι τοῖς ἐν τῷ ὄρει μετὰ τῶν Κερκυραίων προσβαλόντες τὸ μὲν τείχισμα εἷλον· οἱ δὲ ἄνδρες καταπεφευγότες ξυνέβησαν ὥστε τοὺς μὲν ξυμμάχους παραδοῦναι, περὶ δὲ σφῶν τὰ ὅπλα παραδόντων τὸν Ἀθηναίων δῆμον διαγνῶναι. καὶ τούτους ἐς τὴν νῆσον τὴν Πτυχίαν οἱ στρατηγοὶ ἐς φυλακὴν διεκόμισαν ὑποσπόνδους, ἕως ἂν Ἀθήναζε πεμφθῶσιν, ὥστε, ἄν τις ἁλῷ ἀποδιδράσκων, ἅπασι λελύσθαι τὰς σπονδάς. οἱ δὲ τοῦ δήμου προστάται τῶν Κερκυραίων, δεδιότες μὴ οἱ Ἀθηναῖοι τοὺς ἐλθόντας οὐκ ἀποκτείνωσι, μηχανῶνται τοιόνδέ τι. τῶν ἐν τῇ νήσῳ πείθουσί τινας ὀλίγους, ὑποπέμψαντες φίλους καὶ διδάξαντες ὡς κατ' εὔνοιαν δὴ λέγειν ὅτι κράτιστον αὐτοῖς εἴη ὡς τάχιστα ἀποδρᾶναι, πλοῖον δέ τι αὐτοὶ ἑτοιμάσειν. μέλλειν γὰρ δὴ τοὺς στρατηγοὺς τῶν Ἀθηναίων παραδώσειν αὐτοὺς τῷ δήμῳ τῶν Κερκυραίων. ὡς δ' ἐκεῖνοι ἐπείσθησαν καὶ ἐκπλέοντες ἐλήφθησαν, ἐλέλυντό τε αἱ σπονδαὶ καὶ τοῖς Κερκυραίοις παρεδέδοντο οἱ πάντες· οἱ δὲ κατὰ εἴκοσιν ἄνδρας ἐξαγαγόντες, εἴ πού τίς τινα ἴδοι ἐχθρὸν ἑαυτοῦ, ἀπέκτειναν.*

(*b*) *δέσποιν', ἐμοί τοι ξυμφορὰ μὲν ἀρτίως*
ἡ σὴ παρέσχε δεινὸν ἐξαίφνης φόβον·
νῦν δ' ἐννοοῦμαι φαῦλος οὖσα· κἀν βροτοῖς
αἱ δεύτεραί πως φροντίδες σοφώτεραι.
οὐ γὰρ περισσὸν οὐδὲν οὐδ' ἔξω λόγου
πέπονθας· ὀργαὶ δ' ἔς σ' ἀπέσκηψαν θᾶς.
ἐρᾷς· τί τοῦτο θαῦμα; σὺν πολλοῖς βροτῶν.
κἄπειτ' ἔρωτος οὕνεκα ψυχὴν ὀλεῖς;

SECOND YEAR.

GREEK HISTORY AND LITERATURE.

THURSDAY, APRIL 3RD:—AFTERNOON, 4.30 TO 5.30.

1. Explain and discuss the chief constitutional changes in Athens during the period between the Persian War and the Sicilian Expedition.

2. Which do you regard as the four leading battles in Greece, between 470 B.C. and 420 B.C.? Indicate the events which led to them and their chief consequences, and give dates.

3. What do you know of:—Hermocrates, Hagnon, Mitylene, Sybota? Write a life of Brasidas.

4. What do you know of the Dialects of Greece? Illustrate the use of different dialects in connection with different types of literature.

5. What do you know of:—Callinus, Archilochus, Theognis, Terpander, Stesichorus, Bacchylides?

6. Describe the general structure of a Greek Tragedy, illustrating from some one Greek Play.

THIRD YEAR.

GREEK: ARISTOPHANES, EQUITES.

WEDNESDAY, APRIL 9TH:—AFTERNOON, 2 TO 4.

1. Translate, with notes on words and phrases underlined:—

(1) *τί κυνυρόμεθ' ἄλλως; οὐκ ἐχρῆν ζητεῖν τινα*
σωτηρίαν νῷν, ἀλλὰ μὴ κλάειν ἔτι;

(2) *νῦν οὖν ἀνύσαντε φροντίσωμεν, ὠγαθέ,*
ποίαν ὁδὸν νὼ τρεπτέον καὶ πρὸς τίνα.

(3) *οὐκ ἀξιῶ 'γὼ 'μαυτὸν ἰσχύειν μέγα.*

(4) *τουτὶ τί δρᾷ τὸ Χαλκιδικὸν ποτήριον;*
οὐκ ἔσθ' ὅπως οὐ Χαλκιδέας ἀφίστατον.

(5) *ἐν δίκῃ γ' ἐπεὶ τὰ κοινὰ πρὶν λαχεῖν κατεσθίεις,*
κἀποσυκάζεις πιέζων τοὺς ὑπευθύνους, σκοπῶν

ὅστις αὐτῶν ὠμὸς ἐστιν ἢ πέπων ἢ μὴ πέπων·
κἄν τιν' αὐτῶν γνῷς ἀπράγμον' ὄντα καὶ κεχηνότα,
καταγαγὼν ἐκ Χερρονήσου. διαλαβών, ἀγκυρίσας,
εἶτ' ἀποστρέψας τὸν ὦμον. αὐτὸν ἐνεκολήβασας·
καὶ σκοπεῖς γε τῶν πολιτῶν ὅστις ἐστὶν ἀμνοκῶν
πλούσιος καὶ μὴ πονηρὸς καὶ τρέμων τὰ πράγματα.

Discuss the order in which these lines should be read.

(6) εἰ δὲ μὴ σύ γ' οἶσθα κάττυμ', οὐδ' ἐγὼ χορδεύματα,
ὅστις ὑποτέμνων ἐπώλεις δέρμα μοχθηροῦ βοὸς
τοῖς ἀγροίκοισιν πανούργως. ὥστε φαίνεσθαι παχύ,
καὶ πρὶν ἡμέραν φορῆσαι, μεῖζον ἦν δυοῖν δοχμαῖν.

(7) ΑΛΛ. διώξομαί σε δειλίας.
ΠΑΦ. ἡ βύρσα σου θρανεύσεται
ΑΛΛ. δερῶ σε θύλακον κλοπῆς.
ΠΑΦ. διαπατταλευθήσει χάμαι.
ΑΛΛ. περικόμματ' ἔκ σου σκευάσω.
ΠΑΦ. τὰς βλεφαρίδας σου παρατιλῶ.

(8) ἄθρει, καὶ τοῦ ποδὸς παρίει.
ὡς οὗτος ἤδη καικίας ἢ συκοφαντίας πνεῖ.

(9) ἃ δὲ θαυμάζειν ὑμῶν φησιν πολλοὺς, αὐτῷ προσιόντας
καὶ βασανίζειν, πῶς οὐχὶ πάλαι χορὸν αἰτοίη καθ' ἑαυτόν,
ἡμᾶς ὑμῖν ἐκέλευε φράσαι περὶ τούτου.

What are the reasons given in the lines that follow these? Give as full a summary as you can.

10) εἶτ' ἐστεφάνουν μ' εὐαγγέλια· κἀγὼ 'φρασα
αὐτοῖς ἀπόρρητον ποιησάμενος, ταχύ,
ἵνα τὰς ἀφύας ὠνοῖντο πολλὰς τοὐβολοῦ,
τῶν δημιουργῶν συλλαβεῖν τὰ τρύβλια.

(11) τῶν στρατηγῶν ὑποδραμὼν τῶν ἐκ πύλου (so Mss.)
πλεύσας ἐκεῖσε τοὺς Λάκωνας ἤγαγον.

(12) οὐ φροντίζων τῶν ἰδιωτῶν οὐδενός, εἰ σοὶ χαριοίμην.

(13) μιαρώτατος, ὦ Δημακίδιον, καὶ πλεῖστα πανοῦργα δεδρακώς,
ὁπόταν χασμᾷ, καὶ τοὺς καυλοὺς

τῶν εὐθυνῶν ἐκκαυλίζων
καταβροχθίζει, κἀμφοῖν χειροῖν
μυστιλᾶται τῶν δημοσίων.

(14) ἐγὼ δὲ κυλίχνιόν γέ σοι καὶ φάρμακον δίδωμι
τἀν τοῖσιν ἀντικνημίοις ἑλκύδρια περιαλείφειν.

(15) καίτοι πρεσβυτέρων τινῶν
οἵων ἀργαλεωτάτων
ἐν τῷ δείγματι τῶν δικῶν
ἤκουσ' ἀντιλεγόντων
ὡς εἰ μὴ 'γένεθ οὗτος ἐν
τῇ πόλει μέγας, οὐκ ἂν ἦν—
στην σκεύη δύο χρησίμω
δοῖδυξ οὐδὲ τορύνη.

(16) ἓν οὐκ ἀναδιδάσκει σε τῶν λογίων ἑκών,
ὃ μόνον σιδηροῦν ἐστι τεῖχος καὶ ξύλον,
ἐν ᾧ σε σῴζειν τόνδ' ἐκέλευσ' ὁ Λοξίας.

(17) ἡ δ' Ὀβριπάτρα γ' ἐφθὸν ἐκ ζωμοῦ κρέας
καὶ χόλικος ἠνύστρου τε καὶ γαστρὸς τόμον.

(18) τι κάλλιον ἀρχόμενοισιν
ἢ καταπαυομένοισιν
ἢ θοᾶν ἵππων ἐλατῆρας ἀείδειν, μηδὲν ἐς Λυσίστρατον
μηδὲ Θούμαντιν τὸν ἀνέστιον αὖ λυπεῖν ἑκούσῃ καρδίᾳ;

(19) ὁδ' ἐκεῖνος ὁρᾶν τεττιγοφόρας, ἀρχαίῳ σχήματι
λαμπρός,
οὐ χοιρινῶν ὄζων, ἀλλὰ σπονδῶν, σμύρνῃ κατάλειπτος.

2. Describe the structure and general character of the Parabasis.

3. The influence of parody on the vocabulary, style and syntax of comedy.

THIRD YEAR.

GREEK PHILOSOPHY AND ORIGIN OF GREEK DRAMA.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

(*A and B to be shown up in separate books.*)

A.—GREEK PHILOSOPHY.

(*Not more than six questions in A to be attempted.*)

1. Why is *Thales* generally regarded as the first founder of philosophy? What common features have the various systems of which he is the earliest representative?

2. To what schools of philosophy did the following belong?—*Empedocles, Anaxagoras, Xenophanes, Anaximander, Heraclitus.* Give a short account of the teaching of each.

3. Name the most notable of the *Sophists*, and say how far they can be regarded as the exponents of one common philosophical system.

4. Give a brief account of the teaching of *Socrates* in regard to "justice" and "injustice."

5. What are the main points which differentiate the so-called "Minor Socratics" from *Plato* and *Aristotle?*

6. Criticise Plato's conception of the Individual, the Family, and the State, in the "Republic." Contrast it with modern ideals.

7. Give a brief account of Plato's system of Education. Why does he advise the banishment of poets and all but the gravest musicians from his Republic?

8. "Aristotle codified Plato." Explain this statement, naming some of Aristotle's best known works, and briefly characterizing the difference between his teaching and that of Plato, especially on the subject of "Ideas."

9. Give a general account of the philosophy of Epicurus. From what sources is our knowledge of it mainly derived.

10. In what centuries did Stoicism flourish? Connect the extremes to which it led with the political conditions of the time.

11. Give the meaning of the following philosophical terms: *deduction, category, hedonism, metaphysics, apathy, elenchus, empiricism, dialectic, anamnesis, scepticism, metempsychosis.*

B.—Origin and Development of Greek Drama.

1. Indicate some of the leading differences between the Drama of Athens and that of Shakespearian England.

2. What evidence is there for animal-worship in early Greece? Indicate the bearings of this on the origin of the drama.

3. Trace the stages by which the primitive choric song developed into the Drama, giving the leading names and indicating points about which dispute exists.

4. Describe the construction of a Greek Theatre of 400 B.C. What are the chief points in dispute?

5. Compare and contrast the development of Comedy with that of Tragedy. Which is most "primitive" in general character?

6. The influence of Æschylus.

THIRD YEAR.

CLASSICAL HONOURS.

GREEK PRIVATE READINGS.

Wednesday, April 16th:—Morning, 9 to 12.

Translate with notes on words and phrases underlined:—

(i) Sophocles, Antigone.

(*a*) τέλος δ'. ὅτ' οὐδὲν ἦν ἐρευνῶσιν πλέον.
λέγει τις εἷς, ὃς πάντας ἐς πέδον κάρα
νεῦσαι φόβῳ προὔτρεψεν· οὐ γὰρ εἴχομεν
οὔτ' ἀντιφωνεῖν οὔθ' ὅπως δρῶντες καλῶς
πράξαιμεν. ἦν δ' ὁ μῦθος ὡς ἀνοιστέον
σοὶ τοὔργον εἴη τοῦτο κοὐχὶ κρυπτέον.
καὶ ταῦτ' ἐνίκα, κἀμὲ τὸν δυσδαίμονα
πάλος καθαιρεῖ τοῦτο τἀγαθὸν λαβεῖν.
πάρειμι δ' ἄκων οὐχ ἑκοῦσιν, οἶδ' ὅτι.
στέργει γὰρ οὐδεὶς ἄγγελον κακῶν ἐπῶν.

(*b*) ΚΡ. πῶς δῆτ' ἐκείνῳ δυσσεβῆ τιμᾶς χάριν;
ΑΝ. οὐ μαρτυρήσει ταῦθ' ὁ κατθανὼν νέκυς.
ΚΡ. εἴ τοί σφε τιμᾶς ἐξ ἴσου τῷ δυσσεβεῖ.
ΑΝ. οὐ γάρ τι δοῦλος, ἀλλ' ἀδελφὸς ὤλετο.
ΚΡ. πορθῶν δὲ τήνδε γῆν· ὁ δ' ἀντιστὰς ὑπερ.
ΑΝ. ὅμως ὅ γ' Ἅιδης τοὺς νόμους τούτους ποθεῖ.
ΚΡ. ἀλλ' οὐχ ὁ χρηστὸς τῷ κακῷ λαχεῖν ἴσους.
ΑΝ. τίς οἶδεν εἰ κάτωθεν εὐαγὴ τάδε;
Mss. λαχεῖν ἴσος.

(*c*) ΧΟ. Ἔρως ἀνίκατε μάχαν, Ἔρως, ὃς ἐν κτήμασι πίπτεις,
ὃς ἐν μαλακαῖς παρειαῖς νεάνιδος ἐννυχεύεις,
φοιτᾷς δ' ὑπερπόντιος ἔν τ' ἀγρονόμοις αὐλαῖς·
καί σ' οὔτ' ἀθανάτων φύξιμος οὐδεὶς
οὔθ' ἀμερίων σέ γ' ἀνθρώπων, ὁ δ' ἔχων μέμηνεν.
Mss. ἐπ' ἀνθρώπων.

(*d*) γνώσει, τέχνης σημεῖα τῆς ἐμῆς κλύων.
εἰς γὰρ παλαιὸν θᾶκον ὀρνιθοσκόπον
ἵζων, ἵν' ἦν μοι παντὸς οἰωνοῦ λιμήν,
ἀγνῶτ' ἀκούω φθόγγον ὀρνίθων, κακῷ
κλάζοντας οἴστρῳ καὶ βεβαρβαρωμένῳ·
καὶ σπῶντας ἐν χηλαῖσιν ἀλλήλους φοναῖς
ἔγνων· πτερῶν γὰρ ῥοῖβδος οὐκ ἄσημος ἦν.
εὐθὺς δὲ δείσας ἐμπύρων ἐγευόμην
βωμοῖσι παμφλέκτοισιν· ἐκ δὲ θυμάτων
Ἥφαιστος οὐκ ἔλαμπεν, ἀλλ' ἐπὶ σποδῷ
μυδῶσα κηκὶς μηρίων ἐτήκετο
κἄτυφε κἀνέπτυε, καὶ μετάρσιοι
χολαὶ διεσπείροντο, καὶ καταρρυεῖς
μηροὶ καλυπτῆς ἐξέκειντο πιμελῆς.

(*e*) ἰὼ πῦρ πνειόντων χοράγ' ἄστρων, νυχίων
φθεγμάτων ἐπίσκοπε,
παῖ Διὸς γένεθλον, προφάνηθ',
ὦναξ, σαῖς ἅμα περιπόλοις
Θυίαισιν, αἵ σε μαινόμεναι πάννυχοι χορεύουσι
τὸν ταμίαν Ἴακχον.

(ii) Thucydides, VI.

(*a*) Οὓς ἐγὼ ὁρῶν νῦν ἐνθάδε τῷ αὐτῷ ἀνδρὶ παρακελευστοὺς καθημένους φοβοῦμαι, καὶ τοῖς πρεσβυτέροις ἀντιπαρακελεύομαι μὴ καταισχυνθῆναι, εἴ τῳ τις παρακάθηται τῶνδε, ὅπως μὴ δόξῃ, ἐὰν μὴ ψηφίζηται πολεμεῖν, μαλακὸς εἶναι, μηδ', ὅπερ ἂν αὐτοὶ πάθοιεν, δυσέρωτας εἶναι τῶν ἀπόντων, γνόντας ὅτι ἐπιθυμίᾳ μὲν ἐλάχιστα κατορθοῦται, προνοίᾳ δὲ πλεῖστα, ἀλλ' ὑπὲρ τῆς πατρίδος, ὡς μέγιστον δὴ τῶν πρὶν κίνδυνον ἀναρροπτούσης, ἀντιχειροτονεῖν καὶ ψηφίζεσθαι τοὺς μὲν Σικελιώτας οἷσπερ νῦν ὅροις χρωμένους πρὸς ἡμᾶς, οὐ μεμπτοῖς, τῷ τε Ἰονίῳ κόλπῳ παρὰ γῆν ἥν τις πλέῃ, καὶ τῷ Σικελικῷ, διὰ πελάγους, τὰ αὑτῶν νεμομένους καθ' αὑτοὺς καὶ ξυμφέρεσθαι·

(*b*) παρασκευὴ γὰρ αὕτη πρώτη ἐκπλεύσασα μίας πόλεως δυνάμει Ἑλληνικῇ πολυτελεστάτη δὴ καὶ εὐπρεπεστάτη τῶν ἐς ἐκεῖνον τὸν χρόνον ἐγένετο.

(*c*) οὐ μὴν οὐδ' ἂν κατασχεῖν μοι δοκεῖ ποτε Ἱππίας τὸ παραχρῆμα ῥᾳδίως τὴν τυραννίδα, εἰ Ἵππαρχος μὲν ἐν τῇ ἀρχῇ ὢν ἀπέθανεν, αὐτὸς δὲ αὐθημερὸν καθίστατο· ἀλλὰ καὶ διὰ τὸ πρότερον ξύνηθες τοῖς μὲν πολίταις φοβερόν, ἐς δὲ τοὺς ἐπικούρους ἀκριβές, πολλῷ τῷ περιόντι τοῦ ἀσφαλοῦς κατεκράτησε. καὶ οὐχ ὡς ἀδελφὸς νεώτερος ὢν ἠπόρησεν, ἐν ᾧ οὐ πρότερον ξυνεχῶς ὡμιλήκει τῇ ἀρχῇ. Ἱππάρχῳ δὲ ξυνέβη τοῦ πάθους τῇ δυστυχίᾳ ὀνομασθέντα καὶ τὴν δόξαν τῆς τυραννίδος ἐς τὰ ἔπειτα προσλαβεῖν.

Summarize the points in which Thucydides corrects the popular account.

(*d*) οἱ δὲ καὶ διὰ σπουδῆς προσβοηθοῦντες δρόμῳ ὑστέριζον μέν, ὡς δὲ ἕκαστός πη τοῖς πλείοσι προσμείξειε καθίσταντο· οὐ γὰρ δὴ προθυμίᾳ ἐλλιπεῖς ἦσαν οὐδὲ τόλμῃ οὔτ' ἐν ταύτῃ τῇ μάχῃ οὔτ' ἐν ταῖς ἄλλαις, ἀλλὰ τῇ μὲν ἀνδρείᾳ οὐχ ἧσσους ἐς ὅσον ἡ ἐπιστήμη ἀντέχοι, τῷ δὲ ἐλλείποντι αὐτῆς καὶ τὴν βούλησιν ἄκοντες προυδίδοσαν. ὅμως δὲ οὐκ ἂν οἰόμενοι σφίσι τοὺς Ἀθηναίους προτέρους ἐπελθεῖν καὶ διὰ τάχους ἀναγκαζόμενοι ἀμύνασθαι, ἀναλαβόντες τὰ ὅπλα εὐθὺς ἀντεπῆσαν.

(*e*) τό τε φιλόπολι οὐκ ἐν ᾧ ἀδικοῦμαι ἔχω, ἀλλ' ἐν

ᾧ ἀσφαλῶς ἐπολιτεύθην. οὐδ' ἐπὶ πατρίδα οὖσαν ἔτι ἡγοῦμαι νῦν ἰέναι, πολὺ δὲ μᾶλλον τὴν οὐκ οὖσαν ἀνακτᾶσθαι. καὶ φιλόπολις οὗτος ὀρθῶς, οὐχ ὃς ἂν τὴν ἑαυτοῦ ἀδίκως ἀπολέσας μὴ ἐπίῃ, ἀλλ' ὃς ἂν ἐκ παντὸς τρόπου διὰ τὸ ἐπιθυμεῖν πειραθῇ αὐτὴν ἀναλαβεῖν.

(f) ἐξέτασίν τε ὅπλων ἐποιοῦντο καὶ ἐξακοσίους λογάδας τῶν ὁπλιτῶν ἐξέκριναν πρότερον, ὧν ἦρχε Διόμιλος, φυγὰς ἐξ Ἄνδρου, ὅπως τῶν τε Ἐπιπολῶν εἶεν φύλακες, καὶ ἢν ἐς ἄλλο τι δέῃ, ταχὺ ξυνεστῶτες παραγίγνωνται.

(iii) Plato, Selections.

(a) τοιγάρτοι ὃς ἂν οἴηται τραγῳδίαν καλῶς ποιεῖν, οὐκ ἔξωθεν κύκλῳ περὶ τὴν Ἀττικὴν κατὰ τὰς ἄλλας πόλεις ἐπιδεικνύμενος περιέρχεται, ἀλλ' εὐθὺς δεῦρο φέρεται καὶ τοῖσδ' ἐπιδείκνυσιν. εἰκότως. τοὺς δὲ ἐν ὅπλοις μαχομένους ἐγὼ τούτους ὁρῶ τὴν μὲν Λακεδαίμονα ἡγουμένους εἶναι ἄβατον ἱερὸν καὶ οὐδὲ ἄκρῳ ποδὶ ἐπιβαίνοντας, κύκλῳ δὲ περιιόντας αὐτὴν καὶ πᾶσι μᾶλλον ἐπιδεικνυμένους, καὶ μάλιστα τούτοις οἳ κἂν αὐτοὶ ὁμολογήσειαν πολλοὺς σφῶν προτέρους εἶναι πρὸς τὰ τοῦ πολέμου.

(b) πάντες γὰρ οἵ τε τῶν ἐπῶν ποιηταὶ οἱ ἀγαθοὶ οὐκ ἐκ τέχνης ἀλλ' ἔνθεοι ὄντες καὶ κατεχόμενοι πάντα ταῦτα τὰ καλὰ λέγουσι ποιήματα, καὶ οἱ μελοποιοὶ οἱ ἀγαθοὶ ὡσαύτως, ὥσπερ οἱ κορυβαντιῶντες οὐκ ἔμφρονες ὄντες ὀρχοῦνται, οὕτω καὶ οἱ μελοποιοὶ οὐκ ἔμφρονες ὄντες τὰ καλὰ μέλη ταῦτα ποιοῦσιν, ἀλλ' ἐπειδὰν ἐμβῶσιν εἰς τὴν ἁρμονίαν καὶ εἰς τὸν ῥυθμόν, καὶ βακχεύουσι καὶ κατεχόμενοι, ὥσπερ αἱ βάκχαι ἀρύτονται ἐκ τῶν ποταμῶν μέλι καὶ γάλα κατεχόμεναι, ἔμφρονες δὲ οὖσαι οὔ, καὶ τῶν μελοποιῶν ἡ ψυχὴ τοῦτο ἐργάζεται ὅπερ αὐτοὶ λέγουσι.

(c) ἡμεῖς γάρ σε γεννήσαντες, ἐκθρέψαντες, παιδεύσαντες, μεταδόντες ἁπάντων ὧν οἷοί τ' ἦμεν καλῶν σοὶ καὶ τοῖς ἄλλοις πᾶσι πολίταις, ὅμως προαγορεύομεν τῷ ἐξουσίαν πεποιηκέναι Ἀθηναίων τῷ βουλομένῳ, ἐπειδὰν δοκιμασθῇ καὶ ἴδῃ τὰ ἐν τῇ πόλει πράγματα καὶ ἡμᾶς τοὺς νόμους, ᾧ ἂν μὴ ἀρέσκωμεν ἡμεῖς, ἐξεῖναι λαβόντα τὰ αὑτοῦ ἀπιέναι ὅποῖ ἂν βούληται.

(d) Ἆρ' οὖν ἐκεῖνος ἂν τοῦτο ποιήσειε καθαρώτατα, τόσις ὅ τι μάλιστα αὐτῇ τῇ διανοίᾳ ἴοι ἐφ' ἕκαστον, μήτε

τὴν ὄψιν παρατιθέμενος ἐν τῷ διανοεῖσθαι μήτε τινὰ ἄλλην αἴσθησιν ἐφέλκων μηδεμίαν μετὰ τοῦ λογισμοῦ, ἀλλ' αὐτῇ καθ' αὑτὴν εἰλικρινεῖ τῇ διανοίᾳ χρώμενος αὐτὸ καθ' αὑτὸ εἰλικρινὲς ἕκαστον ἐπιχειροῖ θηρεύειν τῶν ὄντων, ἀπαλλαγεὶς ὅ τι μάλιστα ὀφθαλμῶν τε καὶ ὤτων καί, ὡς ἔπος εἰπεῖν, ξύμπαντος τοῦ σώματος, ὡς ταράττοντος καὶ οὐκ ἐῶντος τὴν ψυχὴν κτήσασθαι ἀλήθειάν τε καὶ φρόνησιν, ὅταν κοινωνῇ, ἆρ' οὐχ οὗτός ἐστιν, ὦ Σιμμία, εἴπερ τις καὶ ἄλλος, ὁ τευξόμενος τοῦ ὄντος; Ὑπερφυῶς, ἔφη, ὁ Σιμμίας, ὡς ἀληθῆ λέγεις, ὦ Σώκρατες.

(e) τελέα μὲν οὖν οὖσα καὶ ἐπτερωμένη μετεωροπορεῖ τε καὶ πάντα τὸν κόσμον διοικεῖ· ἡ δὲ πτερορρυήσασα φέρεται, ἕως ἂν στερεοῦ τινὸς ἀντιλάβηται, οὗ κατοικισθεῖσα, σῶμα γήϊνον λαβοῦσα, αὐτὸ αὑτὸ δοκοῦν κινεῖν διὰ τὴν ἐκείνης δύναμιν, ζῷον τὸ ξύμπαν ἐκλήθη, ψυχὴ καὶ σῶμα παγέν, θνητόν τ' ἔσχεν ἐπωνυμίαν· ἀθάνατον δὲ οὐδ' ἐξ ἑνὸς λόγου λελογισμένου, ἀλλὰ πλάττομεν οὔτε ἰδόντες οὔτε ἱκανῶς νοήσαντες θεόν, ἀθάνατόν τι ζῷον, ἔχον μὲν ψυχήν, ἔχον δὲ σῶμα, τὸν ἀεὶ δὲ χρόνον ταῦτα ξυμπεφυκότα.

CLASSICAL HONOURS.

GREEK TRANSLATION AT SIGHT.

MONDAY, APRIL 7TH:—AFTERNOON, 2.30 TO 5.30.

1. ἡ δ' ὑπερωίῳ αὖθι περίφρων Πηνελόπεια
κεῖτ' ἄρ' ἄσιτος. ἄπαστος ἐδητύος ἠδὲ ποτῆτος,
ὁρμαίνουσ' ἢ οἱ θάνατον φύγοι υἱὸς ἀμύμων,
ἦ ὅ γ' ὑπὸ μνηστῆρσιν ὑπεφιάλοισι δαμείη
ὅσσα δὲ μερμήριξε λέων ἀνδρῶν ἐν ὁμίλῳ
δείσας, ὁππότε μιν δόλιον περὶ κύκλον ἄγωσι,
τόσσα μιν ὁρμαίνουσαν ἐπήλυθε νήδυμος ὕπνος·
εὗδε δ' ἀνακλινθεῖσα, λύθεν δὲ οἱ ἅψεα πάντα.

2. ὑπάρχουσι δὲ καὶ ἄλλαι ὁδοὶ πολέμου ἡμῖν, ξυμμάχων τε ἀπόστασις, μάλιστα παραίρεσις οὖσα τῶν προσόδων αἷς ἰσχύουσι, καὶ ἐπιτειχισμὸς τῇ χώρᾳ, ἄλλα τε ὅσα οὐκ ἄν τις νῦν προΐδοι. ἥκιστα γὰρ πόλεμος ἐπὶ ῥητοῖς χωρεῖ, αὐτὸς δε ἀφ' αὑτοῦ τὰ πολλὰ τεχνᾶται πρὸς

τὸ παρατύγχανον· ἐν ᾧ ὁ μὲν εὐοργήτως αὐτῷ προσομιλήσας βεβαιότερος, ὁ δὲ ὀργισθεὶς περὶ αὑτὸν οὐκ ἐλάσσω πταίει. ἐνθυμώμεθα δὲ καὶ ὅτι εἰ μὲν ἦσαν ἡμῶν ἑκάστοις πρὸς ἀντιπάλους περὶ γῆς ὅρων διαφοραι, οἱστὸν ἂν ἦν· νῦν δὲ πρὸς ξύμπαντάς τε ἡμᾶς Ἀθηναῖοι ἱκανοὶ καὶ κατὰ πόλιν ἔτι δυνατώτεροι.

3. ἦ πρὸς μέλαθρα τοῦδε Καπανέως μόλω;
ἥδιστα πρίν γε δῆθ, ὅτ' ἦν παῖς ἥδε μοι.
ἀλλ' οὐκέτ' ἔστιν· ἥ γ' ἐμὴν γενειάδα
προσήγετ' ἀεὶ στόματι, καὶ κάρα τόδε
κατεῖχε χειρί. πατρὶ δ' οὐδὲν ἥδιον
γέροντι θυγατρός. ἀρσένων δὲ μείζονες
ψυχαί, γλυκεῖαι δ' ἧσσον ἐς θωπεύματα.
οὐχ ὡς τάχιστα δῆτά μ' ἄξετ' ἐς δόμους,
σκότῳ δὲ δώσετ', ἔνθ' ἀσιτίαις ἐμὸν
δέμας γεραιὸν συντακεὶς ἀποφθερῶ;
τί μ' ὠφελήσει παιδὸς ὀστέων θιγεῖν;
ὦ δυσπάλαιστον γῆρας. ὡς μισῶ σ' ἔχων.

4. οὐδὲ γὰρ ἐν ταῖς ἰδίαις οἰκίαις ὁρῶ τὸν ἐν ἡλικίᾳ πρὸς τοὺς πρεσβυτέρους οὕτω διακείμενον οὐδ' οὕτως ἀγνώμον' οὐδ' ἄτοπον τῶν ὄντων οὐδένα, ὥστε, εἰ μὴ ποιήσουσιν ἅπαντες ὅσ' ἂν αὐτὸς, οὐ φάσκοντα ποιήσειν οὐδὲν οὐδ' αὐτὸν· καὶ γὰρ ἂν τοῖς τῆς κακώσεως εἴη νόμοις οὕτω γ' ἔνοχος· δεῖ γάρ, οἶμαι, τοῖς γονεῦσι τὸν ὡρισμένον ἐξ ἀμφοτέρων ἔρανον, καὶ παρὰ τῆς φύσεως καὶ παρὰ τοῦ νόμου, δικαίως φέρειν καὶ ἔκονθ' ὑποτελεῖν. ὥσπερ τοίνυν ἑνὸς ἡμῶν ἑκάστου τίς ἐστι γονεὺς, οὕτω συμπάσης τῆς πόλεως κοινοὺς δεῖ γόνους τοὺς σύμπαντας ἡγεῖσθαι, καὶ προσήκει τούτους οὐχ ὅπως ὧν ἡ πόλις δίδωσιν ἀφελέσθαι τι, ἀλλ' εἰ καὶ μηδὲν ἦν τούτων, ἄλλοθεν σκοπεῖν ὅπως μηδενὸς ὄντες ἐνδεεῖς περιοφθήσονται.

5. Ὄρνεον ὦ χάρισιν μεμελημένον, ὦ παρόμοιον
ἀλκυόσιν τὸν σὸν φθόγγον ἰσωσάμενον,
ἡρπάσθης, φίλε λάρε· σὰ δ' ἤθεα, καὶ τὸ σὸν ἡδὺ
πνεῦμα σιωπηραὶ νυκτὸς ἔχουσιν ὁδοί.

CLASSICAL HONOURS.

GREEK PROSE COMPOSITION.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

When the Capuans found themselves blockaded, their spirits fell and they sent an urgent message to Hannibal. In an assault upon the Roman lines he was beaten off with loss. And now only one hope remained. It was possible that, if he threatened Rome itself, the besieging army might be recalled to defend the capital. Accordingly, he sent the Capuans notice of his purpose by means of a pretended deserter; the next morning the Proconsuls saw his camp on Mount Tijata empty. They thought, probably, that he had returned to the South. But they soon discovered the truth from country people, who came in, full of horror, to tell that Hannibal's wild Numidians and monstrous elephants were in full route for Rome. Fulvius sent word to the Senate of this fearful visitation; and the opinion of Fabius was unanimously adopted, that one of the Proconsuls should be recalled to defend the city, while the other was left to maintain the blockade of Capua.

CLASSICAL HONOURS.

HOMER: *Composition of Iliad and text of Books* I, XI, XVIII, XXIII.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

(*A and B to be shown up in separate books.*)

A. COMPOSITION OF ILIAD.

1. In the investigation of the story of the Iliad what advantage is gained by using Π as a point of departure.

2. Give the main supports at which Robert rests his Theory of the Structure of the Iliad. Give examples of some of the substitutions which must be made in the text in order that the Theory may obtain in regard to the two classes of shields.

3. How does Fick's version of the Iliad differ from the Iliad as we now have it? Instance any dialectical changes that may occur to you.

4. Write short notes on the work and place of the Chorizontes—Aristarchus—Zenodotus.

5. What is meant by an "Aristeia?" Mention a few with the position they hold in the Iliad. Give some account of that contained in .

6. What is Lachmann's Theory of the composition of the Iliad?

B. Books I., XI., XVIII., XXIII.

1. Translate, with notes on words and phrases underlined:—

(*a*) ἦ ἐθελεις ὄφρ' αὐτὸς ἔχῃς γέρας, αὐτὰρ ἔμ' αὖτως
ἦσθαι δευόμενον, κέλεαι δέ με τήνδ' ἀποδοῦναι;
ἀλλ' εἰ μὲν δώσουσι γέρας μεγάθυμοι Ἀχαιοί,
ἄρσαντες κατὰ θυμόν, ὅπως ἀντάξιον ἔσται·
εἰ δέ κε μὴ δώωσιν. ἐγὼ δέ κεν αὐτὸς ἕλωμαι
ἢ τεὸν ἢ Αἴαντος ἰὼν γέρας, ἢ Ὀδυσῆος
ἄξω ἑλών· ὁ δέ κεν κεχολώσεται, ὅν κεν ἵκωμαι.

(*b*) αὐτοὶ δὲ πρυλέες σὺν τεύχεσι θωρηχθέντες
ῥώοντ'· ἄσβεστος δὲ βοὴ γένετ' ἠῶθι πρό.
φθὰν δὲ μέγ' ἱππήων ἐπὶ τάφρῳ κοσμηθέντες,
ἵππῆες δ' ὀλίγον μετεκίαθον. ἐν δὲ κυδοιμὸν
ὦρσε κακὸν Κρονίδης, κατὰ δ' ὑψόθεν ἧκεν ἐέρσας
αἵματι μυδαλέας ἐξ αἰθέρος, οὕνεκ' ἔμελλεν
πολλὰς ἰφθίμους κεφαλὰς Ἄιδι προιάψειν.

(*c*) τοξότα, λωβητήρ, κέραι ἀγλαέ, παρθενοπῖπα,
εἰ μὲν δὴ ἀντίβιον σὺν τεύχεσι πειρηθείης,
οὐκ ἄν τοι χραίσμῃσι βιὸς καὶ ταρφέες ἰοί.
νῦν δέ' μ' ἐπιγράψας ταρσὸν ποδὸς εὔχεαι αὔτως.
οὐκ ἀλέγω, ὡς εἴ με γυνὴ βάλοι ἢ πάις ἄφρων·
κωφὸν γὰρ βέλος ἀνδρὸς ἀνάλκιδος οὐτιδανοῖο.

(*d*) ἐν δ' ἐτίθει σταφυλῇσι μέγα βρίθουσαν ἀλωὴν
καλὴν χρυσείην. μέλανες δ' ἀνὰ βότρυες ἦσαν,
ἑστήκει δὲ κάμαξι διαμπερὲς ἀργυρέῃσιν.
ἀμφὶ δὲ κυανέην κάπετον, περὶ δ' ἕρκος ἔλασσεν
κασσιτέρου· μία δ' οἴη ἀταρπιτὸς ἦεν ἐπ' αὐτὴν
τῇ νίσσοντο φορῆες, ὅτε τρυγόῳεν ἀλωήν.
παρθενικαὶ δὲ καὶ ἠίθεοι ἀταλὰ φρονέοντες

πλεκτοῖς ἐν ταλάροισι φέρον μελιηδέα καρπόν.
τοῖσιν δ' ἐν μέσσοισι πάις φόρμιγγι λιγείῃ
ἱμερόεν κιθάριζε, λίνον δ' ὑπὸ καλὸν ἄειδεν
λεπταλέῃ φωνῇ· τοὶ δὲ ῥήσσοντες ἀμαρτῇ
μολπῇ τ' ἰυγμῷ τε ποσὶ σκαίροντες ἕποντο.

(e) πρῶτον μὲν κατὰ πυρκαϊὴν σβέσαν αἴθοπι οἴνῳ,
ὅσσον ἐπὶ φλὸξ ἦλθε, βαθεῖα δὲ κάππεσε τέφρη.
κλαίοντες δ' ἑτάροιο ἐνηέος ὀστέα λευκὰ
ἄλλεγον ἐς χρυσέην φιάλην καὶ δίπλακα δημόν,
ἐν κλισίῃσι δὲ θέντες ἑανῷ λιτὶ κάλυψαν.
τορνώσαντο δὲ σῆμα θεμείλιά τε προβάλοντο
ἀμφὶ πυρήν· εἶθαρ δὲ χυτὴν ἐπὶ γαῖαν ἔχευαν.

2. Comment on :—

(a) παῖδα δ' ἐμοὶ λύσαιτε φίλην τὰ δ' ἄποινα δέχεσθαι
ἀζόμενοι Διὸς υἱόν.

(b) αἴ κέν πως ἀρνῶν κνίσης αἰγῶν τε τελείων
βούλεται ἀντιάσας ἡμῖν ἀπὸ λοιγὸν ἀμῦναι.

(c) ἀλλὰ τὰ μὲν πολίων ἐξεπράθομεν, τὰ δέδασται.

(d) οἵκαδ' ἰὼν σὺν νηυσί τε σῇς καὶ σοῖς ἑτάροισιν.

(e) ὅς κε θεοῖς ἐπιπείθηται, μάλα τ' ἔκλυον αὐτοῦ.

(f) οὐ γάρ πω τοίους ἴδον ἀνέρας οὐδὲ ἴδωμαι.

(g) εἰ δέ μιν αἰχμητὴν ἔθεσαν θεοὶ αἰὲν ἐόντες,
τούνεκά οἱ προθέουσιν ὀνείδεα μυθήσασθαι ;

(h) ἀλλὰ σύ, εἰ δύνασαί γε, περίσχεο παιδὸς ἑοῖο.

(i) Ἄντιφος αὖ παρέβασκε περικλυτός· ὥ ποτ' Ἀχιλ-
λεὺς
Ἴδης ἐν κνημοῖσι δίδη μόσχοισι λύγοισιν.

(k) αἵματι δ' ἄξων
νέρθεν ἅπας πεπάλακτο καὶ ἄντυγες αἳ περὶ δίφρον.

(l) ἐπὶ δ' αἴγειον κνῆ τυρὸν
κνήστι χαλκείῃ.

(m) ἐμεῖο δὲ δῆσεν ἄρεω ἀλκτῆρα γενέσθαι.
So Aristarchus : Mss. ἀρῆς.

(n) ἀλλὰ σὺ μὲν μή πω καταδύσεο μῶλον Ἄρηος.

(o) ξυνὸς ἐνυάλιος, καί τε κτανέοντα κατέκτα.

(*p*) πολλοὶ μὲν βόες ἀργοὶ ὀρέχθεον ἀμφὶ σιδήρῳ σφαζόμενοι.

(*q*) μὴ ἐμὰ σῶν ἀπάνευθε τιθήμεναι ὀστέ', Ἀχιλλεῦ ἀλλ' ὁμοῦ, ὡς ἐτράφημεν ἐ ὑμετέροισι δόμοισι

v. l. ὡς ἐτράφην πϖ.

(*r*) ὅς ποτε Θήβασδ' ἦλθε δεδουπότος Οἰδιπόδαο ἐς τάφον.

CLASSICAL HONOURS.

THUCYDIDES, VII.

WEDNESDAY, APRIL 16TH:—AFTERNOON, 2.30 TO 5.30.

1. Translate and annotate:—

(*a*) ὥστε καὶ τῶν πληρωμάτων οὐχ ἥκιστα τότε πρῶτον κάκωσις ἐγένετο· τῷ τε γὰρ ὕδατι σπανίῳ χρώμενοι καὶ οὐκ ἐγγύθεν, καὶ ἐπὶ φρυγανισμὸν ἅμα ὁπότε ἐξέλθοιεν οἱ ναῦται ὑπὸ τῶν ἱππέων τῶν Συρακοσίων κρατούντων τῆς γῆς διεφθείροντο. τρίτον γὰρ μέρος τῶν ἱππέων τοῖς Συρακοσίοις διὰ τοὺς ἐν τῷ Πλημμυρίῳ, ἵνα μὴ κακουργήσοντες ἐξίοιεν, ἐπὶ τῇ ἐν τῷ Ὀλυμπιείῳ πολίχνῃ ἐτετάχατο.

(*b*) ἐπειδὴ δὲ οἱ Ἀθηναῖοι ναῖς τριάκοντα ναυσὶν ἐξ Ἄργους ὁρμώμενοι Ἐπιδαύρου τέ τι καὶ Πρασιῶν καὶ ἄλλα ἐδῄωσαν καὶ ἐκ Πύλου ἅμα ἐλῄστευον, καὶ ὁσάκις περί του διαφοραὶ γένοιντο τῶν κιτὰ τὰς σπονδὰς ἀμφισβητουμένων, ἐς δίκας προκαλουμένων τῶν Λακεδαιμονίων οὐκ ἤθελον ἐπιτρέπειν, τότε δὴ οἱ Λακεδαιμόνιοι νομίσαντες τὸ παρανόμημα ὅπερ καὶ σφίσι πρότερον ἡμάρτητο, αὖθις ἐς τοὺς Ἀθηναίους τὸ αὐτὸ περιεστάναι, πρόθυμοι ἦσαν ἐς τὸν πόλεμον.

(*c*) ξυνανέπειθε δὲ καὶ ὁ Ἑρμοκράτης οὐχ ἥκιστα τοῦ ταῖς ναυσὶ μὴ ἀθυμεῖν πιχειρῆσαι πρὸς τοὺς Ἀθηναίους λέγων οὐδὲ ἐκείνους πάτριον τὴν ἐμπειρίαν οὐδὲ ἀίδιον τῆς θαλάσσης ἔχειν, ἀλλ' ἠπειρώτας μᾶλλον τῶν Συρακοσίων ὄντας καὶ ἀναγκασθέντας ὑπὸ Μήδων ναυτικοὺς γενέσθαι. καὶ πρὸς ἄνδρας τολμηρούς, οἵους καὶ Ἀθηναίους, τοὺς ἀντιτολμῶντας χαλεπωτάτους ἂν [αὐτοῖς] φαίνεσθαι·

(Mss. ἐπιχειρήσειν.)

(*d*) καὶ τῶν μὲν Κορινθίων τρεῖς νῆες διαφθείρονται, τῶν δὲ Ἀθηναίων κατέδυ μὲν οὐδεμία ἁπλῶς, ἑπτὰ δὲ τινες ἄπλοι ἐγένοντο, ἀντίπρῳροι ἐμβαλλόμεναι καὶ ἀναρραγεῖσαι τὰς παρεξειρεσίας ὑπὸ τῶν Κορινθίων νεῶν ἐπ αὐτὸ τοῦτο παχυτέρας τὰς ἐπωτίδας ἐχουσῶν. ναυμαχήσαντες δὲ ἀντίπαλα μὲν καὶ ὡς αὐτοὺς ἑκατέρους ἀξιοῦν νικᾶν, ὅμως δὲ τῶν ναναγίων κρατησάντων τῶν Ἀθηναίων διά τε τὴν τοῦ ἀνέμου ἄπωσιν αὐτῶν ἐς τὸ πέλαγος καὶ διὰ τὴν τῶν Κορινθίων οὐκέτι ἐπαναγωγήν, διεκρίθησαν ἀπ' ἀλλήλων, καὶ δίωξις οὐδεμία ἐγένετο, οὐδ' ἄνδρες οὐδετέρων ἑάλωσαν·

(*e*) ἐν μὲν γὰρ ἡμέρᾳ σαφέστερα μὲν, ὅμως δὲ οὐδὲ ταῦτα οἱ παραγενόμενοι πάντα πλὴν τὸ καθ' ἑαυτὸν ἕκαστος μόλις οἶδεν· ἐν δὲ νυκτομαχίᾳ, ἣ μόνη δὴ στρατοπέδων μεγάλων ἔν γε τῷδε τῷ πολέμῳ ἐγένετο, πῶς ἄν τις σαφῶς τι ᾔδει; ἦν μέν γὰρ σελήνη λαμπρά, ἑώρων δὲ οὕτως ἀλλήλους ὡς ἐν σελήνῃ εἰκὸς τὴν μὲν ὄψιν τοῦ σώματος προορᾶν, τὴν δὲ γνῶσιν τοῦ οἰκείου ἀπιστεῖσθαι.

(*f*) καὶ οἱ Ἀθηναῖοι οἵ τε πλείους ἐπισχεῖν ἐκέλευον τοὺς στρατηγοὺς ἐνθύμιον ποιούμενοι. καὶ ὁ Νικίας (ἦν γάρ τι καὶ ἄγαν θεασμῷ τε καὶ τῷ τοιούτῳ προσκείμενος) οὐδ' ἂν διαβουλεύσασθαι ἔτι ἔφη, πρίν. ὡς οἱ μάντεις ἐξηγοῦντο, τρὶς ἐννέα ἡμέρας μεῖναι, ὅπως ἂν πρότερον κινηθείη.

(*g*) πολλὴ μὲν γὰρ ἑκατέροις προθυμία ἀπὸ τῶν ναυτῶν ἐς τὸ ἐπιπλεῖν ὁπότε κελευσθείη ἐγιγνετο, πολλὴ δὲ ἡ ἀντιτέχνησις τῶν κυβερνητῶν καὶ ἀγωνισμὸς πρὸς ἀλλήλους· οἵ τε ἐπιβάται ἐθεράπευον, ὁπότε προσπέσοι ναῦς νηί, μὴ λείπεσθαι τὰ ἀπὸ τοῦ καταστρώματος τῆς ἄλλης τέχνης· πᾶς τέ τις ἐν ᾧ προσετέτακτο αὐτὸς ἕκαστος ἠπείγετο πρῶτος φαίνεσθαι.

(*h*) πρὸς γὰρ ἀντιβολίαν καὶ ὀλοφυρμὸν τραπόμενοι ἐς ἀπορίαν καθίστασαν, ἄγειν τε σφᾶς ἀξιοῦντες καὶ ἕνα ἕκαστον ἐπιβοώμενοι, εἴ τινά πού τις ἴδοι ἢ ἑταίρων ἢ οἰκείων, τῶν τε ξυσκήνων ἤδη ἀπιόντων ἐκκρεμαννύμενοι καὶ ἐπακολουθοῦντες ὅσον δύναιντο, εἴ τῳ δὲ προλίποι ἡ ῥώμη καὶ τὸ σῶμα, οὐκ ἄνευ ὀλίγων ἐπιθεασμῶν καὶ οἰμωγῆς ἀπολειπόμενοι.

2. Comment on the following:—

(*a*) τῷ δὲ ἄλλῳ [ἄνω] τοῦ κύκλου πρὸς τὸν Τρώγιλο

ἐπὶ τὴν ἑτεραν θάλασσαν λίθοι τε παραβεβλημένοι τῷ πλέονι ἤδη ἦσαν, καὶ ἔστιν ἃ καὶ ἡμίεργα, τὰ δὲ καὶ ἐξειργασμένα κατελέλειπτο· παρὰ τοσοῦτον μὲν Συράκουσαι ἦλθον κινδύνου.

(*b*) καὶ ξυνετείχισαν τὸ λοιπὸν τοῖς Συρακοσίοις μέχρι [τοῦ Εὐρυήλου] τοῦ ἐγκαρσίου τείχους.

(*c*) ὅπως στρατία ἔτι περαιωθῇ τρόπῳ ᾧ ἂν ἐν ὅλκασιν ἢ πλοίοις ἢ ἄλλως ὅπως ἂν προχωρῇ (so Mss.)

(*d*) οἱ μὲν ἐπ' αὐτομολίας προφάσει ἀπέρχονται.

(*e*) οὗτοι μὲν οὖν ἐν τοῖς πρῶτοι ὁρμήσαντες ἀπὸ τοῦ Ταινάρου τῆς Λακωνικῆς ἐς τὸ πέλαγος ἀφῆκαν.

(*f*) σχόντες ἐς τὰ καταντικρὺ Κυθήρων τῆς Λακωνικῆς.

(*g*) τὸ γὰρ αὐτοὺς πολιορκουμένους ἐπιτειχισμῷ ὑπὸ Πελοποννησίων μηδ' ὡς ἀποστῆναι ἐκ Σικελίας, ἀλλὰ ἐκεῖ Συρακούσας τῷ αὐτῷ τρόπῳ ἀντιπολιορκεῖν, πόλιν οὐδὲν ἐλάσσω αὐτήν γε καθ' αὑτὴν τῆς Ἀθηναίων. καὶ τὸν παράλογον τοσοῦτον ποιῆσαι τοῖς Ἕλλησι τῆς δυνάμεως καὶ τόλμης, ὅσον κατ' ἀρχὰς τοῦ πολέμου οἱ μὲν ἐνιαυτόν, οἱ δὲ δύο, οἱ δὲ τριῶν γε ἐτῶν, οὐδεὶς πλείω χρόνον ἐνόμιζον περιοίσειν αὐτούς. εἰ οἱ Πελοποννήσιοι ἐσβαλοῖεν ἐς τὴν χώραν. ὥστε ἔτει ἑπτακαιδεκάτῳ μετὰ τὴν πρώτην ἐσβολὴν ἦλθον ἐς Σικελίαν. (so Mss)

(*h*) ἀπροσδοκήτοις μὴ ἂν ποτέ τινας σφίσιν ἀπὸ θαλάσσης τοσοῦτον ἐπαναβάντας ἐπιθέσθαι.

(*i*) καὶ αὐτοῖς οἱ Κροτωνιᾶται προσπέμψαντες εἶπον οὐκ ἂν σφίσι βουλομένοις εἶναι διὰ τῆς γῆς σφῶν τὸν στράτον ἰέναι.

(*k*) περιπλεῦσαι δ' ἐς τὴν εὐρυχωρίαν, σφῶν ἐχόντων τὴν ἐπίπλευσιν ἀπὸ τοῦ πελάγους τε καὶ ἀναχώρησιν, οὐ δυνήσεσθαι αὐτούς.

(*l*) ναῦς τρεῖς καὶ ἑβδομήκοντα ξὺν ταῖς ξενικαῖς.

3. Discuss the chief disputed points in regard to the topography of the siege-works at Syracuse.

4. Why did Macaulay call this book 'the *ne plus ultra* of human art'?

CLASSICAL HONOURS.

GREEK: ÆSCHYLUS, AGAMEMNON.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. Translate, with notes:—

(*a*) εὖτ' ἂν δὲ νυκτίπλαγκτον ἔνδροσόν τ' ἔχω
εὐνὴν ὀνείροις οὐκ ἐπισκοπουμένην
† ἐμήν,—φόβος γὰρ ἀνθ' ὕπνου παραστατεῖ,
τὸ μὴ βεβαίως βλέφαρα συμβαλεῖν ὕπνῳ·—
ὅταν δ' ἀείδειν ἢ μινύρεσθαι δοκῶ,
ὕπνου τόδ' ἀντίμολπον ἐντέμνων ἄκος.
κλαίω τότ' οἴκου τοῦδε συμφορὰν στένων,
οὐχ ὡς τὰ πρόσθ' ἄριστα διαπονουμένου.

(*b*) στάζει δ' ἔν θ' ὕπνῳ πρὸ καρδίας
μνησιπήμων πόνος· καὶ παρ ἄ-
κοντας ἦλθε σωφρονεῖν.
δαιμόνων δέ που χάρις *βίαιος,
σέλμα σεμνὸν ἡμένων.

(*c*) Ἥφαιστος Ἴδης λαμπρὸν ἐκπέμπων σέλας.
φρυκτὸς δὲ φρυκτὸν δεῦρ' ἀπ' ἀγγάρου πυρὸς
ἔπεμπεν· Ἴδη μὲν πρὸς Ἑρμαῖον λέπας
Λήμνου· μέγαν δὲ πανὸν ἐκ νήσου τρίτον
Ἄθωον αἶπος Ζηνὸς ἐξεδέξατο,
ὑπερτελής τε, πόντον ὥστε νωτίσαι,
† ἰσχὺς πορευτοῦ λαμπάδος πρὸς ἡδονὴν
* πέμπει τὸ χρυσοφεγγὲς ὥς τις ἥλιος
σέλας παραγγείλασα Μακίστου * σκοπαῖς·†
ὁ δ' οὔτι μέλλων οὐδ' ἀφρασμόνως ὕπνῳ
νικώμενος παρῆκεν ἀγγέλου μέρος·

(*d*) λιποῦσα δ' ἀστοῖσιν ἀσπίστορας στρ. β'.
*τε καὶ κλόνους λογχίμους ναυβάτας *θ' ὁπλισμούς,
ἄγουσά τ' ἀντίφερνον Ἰλίῳ φθοράν,
βέβακεν ῥίμφα διὰ πυλᾶν,
ἄτλητα τλᾶσα· πολλὰ δ' ἔστενον
τόδ' ἐννέποντες δόμων προφῆται·
ἰὼ ἰὼ δῶμα δῶμα καὶ πρόμοι.
ἰὼ λέχος καὶ στίβοι φιλάνορες.
†* πάρεστι σιγὰς ἀτίμους ἁλοιδόρους
* αἴσχιστ' ἀφειμένων ἰδεῖν.†
πόθῳ δ' ὑπερπονtίας

φάσμα δόξει δόμων ἀνάσσειν.
εὐμόρφων δὲ κολοσσῶν
ἔχθεται χάρις ἀνδρί.
ὀμμάτων δ' ἐν ἀχηνίαις ἔρρει πᾶσ' Ἀφροδίτα.

(e) μόχθους γὰρ εἰ λέγοιμι καὶ δυσαυλίας,
σπαρνὰς παρήξεις καὶ κακοστρώτους, τί δ' οὐ
στένοντες, οὐ † λαχόντες ἥματος μέρος ;
τὰ δ' αὖτε χέρσῳ καὶ προσῆν, πλέον στύγος·
εὐναὶ γαρ ἦσαν δαΐων πρὸς τείχεσιν·
ἐξ οὐρανοῦ δὲ κἀπὸ γῆς λειμώνιαι
† δρόσοι κατεψάκαζον, ἔμπεδον σίνος
ἐσθημάτων, τιθέντες ἔνθηρον τρίχα.

(f) † χρόνος δ' ἐπὶ
πρυμνησίων *ξυνεμβολαῖς
ψαμμίας ἀκάτας παρή-
βησεν, εὖθ' ὑπ' Ἴλιον
ὧρτο ναυβάτας στρατός.

(g) ΚΑ. ἀλλ' ἄρκυς ἡ ξύνευνος, ἡ ξυναιτία
φόνου. στάσις δ' ἀκόρετος γένει
κατολολυξάτω θύματος λευσίμου.
ΧΟ. ποίαν Ἐρινὺν τήνδε δώμασιν κέλει
ἐπορθιάζειν ; οὔ με φαιδρύνει λόγος.
ἐπὶ δὲ καρδίαν ἔδραμε κροκοβαφὴς
σταγών, † ἅτε *καιρία πτώσιμος
ξυνανύτει βίου δύντος αὐγαῖς.
ταχεῖα δ' ἄτα πέλει.

(h) νεῶν τ' ἔπαρχος Ἰλίου τ' ἀναστάτης
† οὐκ οἶδεν οἷα γλῶσσα μισητῆς κυνὸς
λέξασα, κἀκτείνασα φαιδρόνους, δίκην
ἄτης λαθραίου, τεύξεται κακῇ τύχῃ.†
* τοιᾶδε τόλμῃ θῆλυς ἄρσενος φονεὺς
ἔστιν. τί νιν καλοῦσα δυσφιλὲς δάκος
τύχοιμ' ἄν ; ἀμφίσβαιναν ἢ Σκύλλαν τινὰ
οἰκοῦσαν ἐν πέτραισι, ναυτίλων βλάβην,
θύουσαν Ἅιδου μητέρ', ἄσπονδόν τ' Ἄρη
φίλοις πνέουσαν ;

(i) οὕτω τὸν αὑτοῦ θυμὸν ὁρμαίνει πεσών·
κἀκφυσιῶν ὀξεῖαν αἵματος σφαγὴν
βάλλει μ' ἐρεμνῇ ψακάδι φοινίας δρόσου,
χαίρουσαν οὐδὲν ἧσσον ἢ * διοσδότῳ
γάνει σπορητὸς κάλυκος ἐν λοχεύμασιν.

(*k*) δέδοικα δ' ὄμβρου κτύπον δομοσφαλῆ
τὸν αἱματηρόν· ψακὰς δὲ λήγει.
δίκην δ' ἐπ' ἄλλο πρᾶγμα * θηγάνει βλάβης
πρὸς ἄλλαις θηγάναισι Μοῖρα.
ἰὼ γᾶ γᾶ, εἴθ' ἔμ' ἐδέξω. ἀντ. ά.
πρὶν τόνδ' ἐπιδεῖν ἀργυροτοίχου
δροίτας κατέχοντα χαμεύναν.

2. Comment on :—

(*a*) τρόπον αἰγυπιῶν, οἵτ' ἐκπατίοις
ἄλγεσι παίδων ὕπατοι λεχέων
στροφοδινοῦνται.

(*b*) βοσκόμενοι λαγίναν.
ἐρικύματα φέρματι γένναν
βλαβέντα λοισθίων δρόμων.

(*c*) ΧΟ. πῶς φής ; πέφευγε τοὔπος ἐξ ἀπιστίας.
ΚΛ. Τροίαν Ἀχαιῶν οὖσαν· ἢ τορῶς λέγω

(*d*) τοιοίδε τοί μοι λαμπαδηφόρων νόμοι,
ἄλλος παρ' ἄλλου διαδοχαῖς πληρούμενοι·
νικᾷ δ' ὁ πρῶτος καὶ τελευταῖος δραμών.

(*e*) τείνοντα πάλαι τόξον, ὅπως ἂν
μήτε πρὸ καιροῦ μήθ' ὑπὲρ ἄστρων
βέλος ἠλίθιον σκήψειεν.

(*f*) τὸ δέ ὑπερκόπως κλύειν εὖ
βαρύ· βάλλεται γὰρ ὅσσοις
Διόθεν κεραυνός.

(*g*) λέγουσιν ἡμᾶς ὡς ὀλωλότας, τί μή ;

(*h*) ηὔξω θεοῖς δείσας ἂν ὧδ' ἔρδειν τάδε.

3. Discuss the following Ms. readings :—

(*a*) τούτων λέξασ' ὅ τι καὶ δυνατὸν
καὶ θέμις αἰνεῖν
παιών τε γενοῦ τῆσδε μερίμνης,
ἣ νῦν τότε μὲν κακόφρων τελέθει,
τότε δ' ἐκ θυσιῶν ἀγανὰ φαίνεις
ἐλπὶς ἀμύνει φροντίδ' ἄπλειστον
τὴν θυμοφθόρον λύπης φρένα.

(*b*) ὤτρυνε θεσμὸν μὴ χαρίζεσθαι πυρός.

(*c*) οὐκ ἄν ἑλόντες αὖθις αὖ θάνοιεν ἄν.

(*d*) πέφανται δ' ἐγγόνους

ἀτολμήτων Ἄρη
πνεόντων μεῖζον ἢ δικαίως.

(*e*) ἅλις παρὰ Σκάμανδρον ἦλθ' ἀνάρσιος·
νῦν δ' αὖτε σωτὴρ ἴσθι καὶ παγώνιος,
ἄναξ Ἄπολλον.

(*f*) ἔθρεψεν δὲ λέοντα
σίνιν δόμοις ἀγάλακτον
οὗτος ἀνὴρ φιλόμαστον.

(*g*) φιλεῖ δὲ τίκτειν ὕβρις μὲν παλαιὰ νεά-
ζουσαν ἐν κακοῖς βροτῶν
ὕβριν τότ' ἢ τόθ', ὅταν τὸ κύριον μόλῃ
νεαρὰ φάους κότον δαίμονά τε τὸν ἄμαχον, ἀπόλεμον
ἀνίερον θράσος μελαί—
νας μελάθροισιν ἄτας,
εἰδομέναν τοκεῦσιν.

In line 4 is υ— too much.

(*h*) οὐδὲ τὸν ὀρθοδαῆ
τῶν φθιμένων ἀνάγειν Ζεὺς αὖτ' ἔπαυσ' ἐπ' εὐλαβείᾳ.

(*i*) πῶς δῆτ' ἄνακτος ἦσθα Λοξίου κότῳ.

FIRST YEAR.

LATIN.

FRIDAY, APRIL 5TH:—MORNING, 9 TO 12.

N.B.—*Answers to (A) and (B) to be sent up in different books.*

A.—OVID AND NEPOS.

1. Translate:—

(*a*) Haec, precor, evincat, propulsaque fortibus austris
transeat instabiles strenua Cyaneas.

What were the Cyaneae? By what other name are they called by Ovid?

What is unusual in the metre of the second line.

(*b*) Tinguitur oceano custos Erymanthidos ursae.

What star is meant? What does *Erymanthidos* come from? Where is Erymanthus?

(*c*) Accedam profugae sarcina parva rati.

(*d*) O mihi Thesea pectora juncta fide.

Scan this line and explain the epithet *Thesea*.

(*e*) Protinus ut moriar non ero terra tuus.

(*f*) Postque meos ortus Pisaea vinctus oliva
abstulerat decies praemia victor eques.

Explain these lines briefly.

(*g*) Par eadem nostra nunc est sibi facta ruina.

(*h*) Cernis ut Admeti cantetur et Hectoris uxor
ausaque in accensos Iphias ire rogos?
ut vivat fama coniunx Phylaceia, cuius
Iliacam celeri vir pede pressit humum?

What were the names of the four women referred to here, and who was the *vir* referred to in the last line?

(*i*) Tempora Phoebea lauro cingetur, Ioque,
miles, Io, magna voce triumphe canet.

(*k*) Cumque bonis nuribus pro sospite Livia nato
munera dat meritis, saepe datura, deis,

Who are the persons referred to as 'nuribus' and who were their husbands?

(*l*) Hic locus est Vestae, qui Pallada servat et ignem.

Explain *Pallada* and *ignem*.

(*m*) Impositamque sibi qui non bene pertulit Hellen,
tempora nocturnis aequa diurna facit.

Explain 'qui non bene pertulit Helen' and also the second line.

(*n*) Samii sunt rata dicta senis

Who is meant by *Samii senis?*

(*o*) Fratrem Thebana peremptum
supposuit tumulo rege vetante soror.

Who were the *rex soror* and *fratrem?*

2. Translate back into Latin:—

(*a*) Here I am a barbarian because I am understood by none and the foolish Getae mock at Latin words.

(*b*) Providing only I may be transferred from here let even Zanclean Charybdis devour me and send me down to Styx in her waters.

(*c*) Here I was born and moreover, that you may know the time, when both consuls fell by the same doom.

3. Translate:—

(*a*) Idem muros Atheniensium restituit praecipuo suo periculo.

Who is referred to? What were the walls called?

(*b*) Hanc legationem suscepit Themistocles et solus primo profectus est; reliqui legati ut tum exirent cum satis alti tuendo muri exstructi viderentur, praecepit: interim omnes, servi atque liberi, opus facerent neque ulli loco parcerent, sive sacer sive privatus esset sive publicus et undique quod idoneum ad muniendum putarent, congererent.

(*c*) Nam cum ab Atheniensibus et Lacedaemoniis exposceretur publice, supplicem non prodidit monuitque ut consuleret sibi: difficile enim esse in tam propinquo loco tuto eum versari.

(*d*) Tamen a Themistocle collabefactus testula illa exilio decem annorum multatus est.

(*e*) Quos quo facilius repellerent, si forte bellum renovare conarentur, ad classis aedificandas exercitusque comparandos quantum pecuniae quaeque civitas daret Aristides delectus est qui constitueret, eiusque arbitrio CCCCLX talenta quotannis Delum sunt collata.

Write out the number in this extract in full in Latin. What do you know of Delos?

(*f*) Est genus quoddam hominum, quod Hilotae vocatur. Who were the Hilotæ?

(*g*) Fuit enim tanta liberalitate cum compluribus locis praedia hortosque haberet ut nunquam in eis custodem imposuerit fructus servandi gratia ne quis impediretur quo minus eis rebus quibus quisque vellet frueretur. Who is described here?

(*h*) Sic enim facillime putavit se Graeca lingua loquentes, qui Asiam incolerent, sub sua retenturum potestate, si amicis suis oppida tuenda tradidisset quibus se oppresso nulla spes salutis relinqueretur.

Explain *sic*.

B.—SELECTED READINGS. (ROMAN LIFE).

1. Translate:

(*a*) Heia, viri, *nostrum* reboans echo sonet heia!
Arbiter effusi late maris ore sereno
Placatum stravit pelagus posuitque procellam,
Edomitique vago sederunt pondere fluctus.

(*b*) Quod si non hic tantus fructus ostenderetur et si ex his studiis delectatio sola *peteretur*, tamen, ut opinor, hanc animi adversionem humanissimum ac liberalissimum iudicaretis. Nam ceterae neque temporum sunt neque aetatum omnium neque locorum: haec studia adulescentiam alunt, senectutem oblectant, delectant domi, non impediunt foris, pernoctant nobiscum, peregrinantur, rusticantur.

(*c*) Dum talia secum
Exigit Hippomenes passu volat alite virgo.
Quae quamquam Scythica non secius ire sagitta

Aonio visa est iuveni, tamen ille decorem
Miratur magis. Et cursus facit ille decorem.
Aura refert ablata citis talaria plantis:
Tergaque iactantur crines per eburnea, quaeque
Poplitibus suberant picto genualia limbo.

(*d*) Tunc Mucius quasi remunerans meritum, "Quandoquidem," inquit, "est apud te virtuti honos, ut beneficio tuleris a me, quod minis nequisti: trecenti coniuravimus principes iuventutis Romanae, ut in te hac via grassaremur. Mea prima sors fuit; ceteri, utcumque ceciderit primi, quoad te opportunum fortuna dederit, suo quisque tempore aderunt."

(*e*) Nostris versibus esse te poetam,
Fidentine, putas cupisque credi?
Sic dentata sibi videtur Aegle
Emptis ossibus Indicoque cornu:
Sic quae nigrior est cadente moro,
Cerussata sibi placet Lycoris.
Hac et tu ratione qua poeta es,
Calvus cum fueris, eris comatus.

(*f*) Tu ne quaesiveris, scire nefas, quem mihi, quem tibi
Finem di dederint, Leuconoe, nec Babylonios
Tentaris numeros. Ut melius quidquid erit pati,
Seu plures hiemes seu tribuit Juppiter ultimum,
Quae nunc oppositis debilitat pumicibus mare
Tyrrhenum. Sapias, vina liques et spatio brevi
Spem longam reseces. Dum loquimur fugerit invida
Aetas: carpe diem quam minimum credula postero.

2. Explain the form, meaning, or construction of the words printed in italics.

3. Write brief notes on the life and works of: Ennius, Livy, Martial

FIRST YEAR.

LATIN PROSE AND UNSEEN.

FRIDAY, APRIL 4TH:—AFTERNOON, 2.30 TO 5.30.

Translate:—

(*a*) I repented of my crime.

(*b*) He said that Caesar ought to have come to Athens.

(*c*) He wanted to know when they wished to depart and what was the size of the island.

(*d*) Have they done this for the sake of helping their friends?

(*e*) Having arrived at Myus, Marcellus could not be persuaded to attack the camp.

(*f*) The rich must not be envied.

(*g*) This defeat will mean destruction to the Roman people.

(*h*) The senate ordered the King to send eight hundred ships, reminding him that he must fight for his own safety.

(*i*) He lived three months in Italy at Naples and Tarentum and departed to Salamis six years after the consuls had been slain.

(*k*) Having armed the slaves he resisted the enemy with great vigour.

(*l*) We were persuaded that we must hasten so that the citizens might not die of hunger.

For Unseen.

1. DEATH OF CN. POMPEIUS.

Pompeius profugiens cum duobus Lentulis consularibus Sextoque filio et Favonio praetorio, quos comites ei fortuna adgregaverat, aliis, ut Parthos, aliis, ut Africam peteret, in qua fidelissimum partium suarum haberet regem Jubam, suadentibus, Aegyptum petere proposuit memor beneficiorum, quae in patrem eius Ptolemaei, qui tum puero quam iuveni propior regnabat Alexandriae, contulerat. sed quis in adversis beneficiorum servat me-

moriam? aut quis ullam calamitosis deberi putat gratiam? aut quando fortuna non mutat fidem? missi itaque ab rege qui venientem Cn. Pompeium (is iam a Mytilenis Corneliam uxorem receptam in navem fugae comitem habere coeperat) consilio Theodoti et Achillae exciperent hortarenturque ut ex oneraria in eam navem, quae obviam processerat, transcenderet: quod cum fecisset, princeps Romani nominis imperio arbitrioque Aegyptii mancipii C. Caesare P. Servilio consulibus iugulatus est.

2. On the Death of his Friend Crispus.

Ablatus mihi Crispus est amicus,
pro quo si pretium dari liceret,
nostros dividerem libenter annos,
nunc pers optima me mei reliquit,
Crispus, praesidium meum, voluptas,
portus, deliciae: nihil sine illo
laetum mens mea iam putabit esse.
consumptus male debilisque vivam:
plus quam dimidium mei recessit.

FIRST YEAR.

LATIN.

ROMAN HISTORY.

Friday, April 4th:—Afternoon, 5.30 to 6.

1. Explain the following terms:—lex, plebiscitum, populus, plebs, comitia, praetor, magister equitum.

2. Trace the development of the method of trying a Roman on a capital charge. Add dates and names where you can.

3. State what events are connected with the following places, adding the position of each:—Aegatian islands, Cannae, Metaurus, Zama, Cynoscephalae, Pydna. Add dates where you can.

4. What do you know of M. Fulvius Nobilior, Cato the Elder, Maharbal, Titus Flamininus, Philopoemen, Masinissa?

SECOND YEAR.

LATIN.

FRIDAY, APRIL 4TH:—MORNING, 9 TO 12.

(*Answers to A and B to be written in separate books.*)

A.

1. Translate:

(*a*) *Virtus* repulsae nescia sordidae
intaminatis fulget honoribus
nec sumit aut ponit *secures*
arbitrio popularis aurae.

Virtus recludens immeritis mori
caelum *negata* tentat iter via,
coetusque vulgares et udam
spernit humum fugiente penna.

(*b*) Quem virum aut heroa lyra vel acri
tibia sumis celebrare, *Clio?*
quem deum? cuius recinet iocosa
nomen imago
aut in umbrosis *Heliconis* oris
aut super Pindo gelidove in *Haemo?*
unde vocalem temere insecutae
Orphea silvae,
arte *materna* rapidos morantem
fluminum lapsus celeresque ventos,
blandum et auritas fidibus canoris
ducere quercus.

(*c*) Te decem tauri totidemque vaccae,
me tener solvet vitulus, relicta
matre qui largis iuvenescit herbis
in mea vota,
fronte curvatos imitatus ignes
tertium lunae referentis ortum,
qua notam duxit, niveus videri
cetera fulvus.

(*d*) Sectus flagellis hic *triumviralibus*
praeconis ad fastidium
arat Falerni mille fundi iugera
et Appiam mannis terit,
sedilibusque magnus in primis eques
Othone contempto sedet!

2. (*a*) Explain briefly the relation to the context of the above extracts.

(*b*) Write brief explanatory notes on words or phrases printed in italics.

3. Name the metre of each of these extracts, and scan the first stanza of (*a*).

4. Translate:

(*a*) Ac veluti pleno lupus insidiatus ovili
cum fremit ad caulas, ventos perpessus et imbres,
nocte super media: tuti sub matribus agni
balatum exercent; ille asper et improbus ira
saevit in absentes: collecta fatigat edendi
ex longo rabies et siccae sanguine fauces:
haud aliter Rutulo muros et castra tuenti,
ignescunt irae

(*b*) Unus homo et vestris, o cives, undique saeptus
aggeribus tantas strages inpune per urbem
ediderit? iuvenum primos tot miserit Orco?
non infelicis patriae veterumque deorum
et magni Aeneae, segnes, miseretque pudetque?
talibus accensi firmantur et agmine denso
consistunt.

5. Translate and write brief notes on the following passages:

(*a*) Obstipuere *animis* Rutuli.

(*b*) Dat Niso Mnestheus *pellem horrentesque leonis exuvias.*

(*c*) *Venatu* invigilant pueri silvasque fatigant.

(*f*) Tum sonitu *Prochyta* alta tremit durumque cubile
Inarime Iovis imperiis inposta *Typhoeo.*

(*g*) O vere Phrygiae (neque enim Phryges), ite *per alta*
Dindyma, ubi adsuetis *biforem* dat tibia cantum.

(*h*) 'En' ait, et iaculum attorquens emittit in auras,
principium pugnae, et campo sese arduus infert.

(*g*) Egressi superant fossas noctisque per umbram
castra inimica petunt, *multis* tamen *ante futuri exitio.*

6. Mark the quantities of the vowels in the following words: inimica, adgreditur, redimicula, prodidit, moriens.

B.—Cicero.

1. Translate:—

(*a*) Ut cetera exstinguntur, sic sepulcra sanctiora fiunt vetustate.

(*b*) Augeatur igitur isto honore etiam is vir cui nullus honos tribui non debitus potest.

(*c*) Verum quod ego laboribus periculis inimicitiisque meis tum cum admissum erit dedecus severe me persecuturum esse polliceor id ne accidat tu tua auctoritate sapientia diligentia M'. Glabrio, potes providere.

Explain *inimicitiis*.

(*d*) Est ridiculum ad ea quae habemus nihil dicere quaerere quae habere non possumus, et de hominum memoria tacere litterarum memoriam flagitare, et cum habeas amplissimi viri religionem integerrimi municipii ius iurandum fidemque ea quae depravari nullo modo possunt repudiare tabulas quas idem dicis solere corrumpi desiderare.

Who is the *vir amplissimus* and what is the municipium referred to?

(*e*) Nam ceterae neque temporum sunt neque aetatum omnium neque locorum: haec studia adulescentiam agunt, senectutem oblectant, secundas res ornant, adversis erfugium ac solatium praebent, delectant domi, non impediunt foris, pernoctant nobiscum, peregrinantur, rusticantur.

(*f*) Qui ad vos ab exteris nationibus venirent captos querar cum legati populi Romani redempti sint?

(*g*) Reliquum est ut de felicitate quam praestare de se ipso nemo potest meminisse et commemorare de altero possumus *sicut aequum est homines de potestate deorum* timide et pauca dicamus.

To what does the clause in italics refer?

(*h*) Si quid in dicendo consequi possum eis ostendam potissimum qui ei quoque rei fructum suo iudicio tribuendum esse duxerunt.

What does he refer to in the last clause?

(*i*) Nam hoc Verrem dicere aiebant te non fato ut ceteros ex vestra familia sed opera sua consulem factum.

Who is meant by *te?* What epigram does Cicero refer to?

SECOND YEAR.

LATIN.

FRIDAY, APRIL 4TH:—AFTERNOON, 2.30 TO 5.

(*Write A and B in separate books.*)

A.—LATIN PROSE COMPOSITION.

On the following day a crowded[1] meeting of the senate was granted to Hannibal. His first speech there was very courteous[2] and kind, in which he thanked the campanians for having preferred his friendship to the Roman alliance, and among other glorious promises he declared "that in a short time Capua should be the capital of the whole of Italy, and that along with other nations even the Roman people should seek laws from thence. That one man was without share[3] in the Carthaginian friendship and the treaty made with him, Magius Decius. That he demanded his surrender, and that in his presence a motion[4] should be made concerning him, and a decree of the senate passed."

[1]*Frequens senatus.* [2]*perblandus.* [3]*exsors.* [4]*referre de aliquo.*

B.—TRANSLATION AT SIGHT.

Ac ne illa quidem promissa servanda sunt, quae non sunt eis ipsis utilia, quibus illa promiseris. Sol Phaethonti filio, ut redeamus ad fabulas, *facturum se esse* dixit, *quidquid optasset.* Optavit, *ut in currum patris tolleretur.* Sublatus est. Atque is, antequam constitit, ictu fulminis deflagravit. Quanto melius fuerat in hoc promissum patris non esse servatum!....Quid? Agamemnon, cum devovisset Dianae *quod in suo regno pulcherrimum natum esset illo anno*, immolavit Iphigeniam, qua nihil erat eo quidem anno natum pulchrius. Promissum potius non faciendum, quam tam taetrum facinus admittendum fuit. Ergo et promissa non facienda nonnumquam, neque semper deposita reddenda. Si gladium quis apud te sana mente deposuerit, repetat insaniens: reddere peccatum sit, officium non reddere. Quid? si is, qui apud te pecuniam deposuerit, bellum inferat patriae, reddasne depositum? Non, credo: facias enim contra rempublicam, quae debet esse carissima. Sic multa, quae honesta natura videntur esse,

temporibus fiunt non honesta. Facere promissa, stare conventis, reddere deposita, commutata utilitate, fiunt non honesta.

FACULTY OF ARTS.

SECOND YEAR.

ROMAN HISTORY AND LITERATURE.

FRIDAY, APRIL 4TH:— AFTERNOON, 5 TO 6.

Candidates are expected to answer not more than three questions from each division.

A.

1. Describe the series of measures known as the Sempronian laws. Give the date of their enactment.

2. Give the date, cause and brief history of the Jugurthine war.

3. Sketch the Sullan Constitution (B.C., 82-80).

4. Give an account of the scandalous abuses which marked the administration of Verres in Sicily.

5. Assign leading events to the following dates:— B. C. 121, 90-88, 86, 73-71, 45, 42, 31.

B.

1. State briefly what you conceive to be the nature of the debt which Rome owed to Greece in the development of her national literature.

2. What features of their poetry entitle Virgil and Horace to be ranked as the literary representatives of imperialism in the Augustan Age at Rome?

3. Show how intimately connected was the profession of eloquence with the national life at Rome. Illustrate by reference to Cicero's career as an orator.

4. Briefly characterize the position and influence in Roman literature of each of the following writers:— *Ennius, Lucretius, Martial, Pacuvius, Varro.*

THIRD AND FOURTH YEARS.

LATIN.

FRIDAY, APRIL 4TH:—MORNING, 9 TO 12.

(*Write A and B in separate papers.*)

A.—JUVENAL AND PLAUTUS.

1. Translate:

Ut tamen et poscas aliquid voveasque sacellis
exta et candiduli divina tomacula porci,
orandum est ut sit mens sana in corpore sano.
fortem posce animum mortis terrore carentem,
qui spatium vitae extremum inter munera ponat
naturae, qui ferre queat quoscumque labores,
nesciat irasci, cupiat nihil, et potiores
Herculis aerumnas credat saevosque labores
et venere et cenis et pluma Sardanapalli.

2. Translate, adding explanatory notes:

(*a*) His ego quem monui? te cum est mihi sermo, *Rubelli*
Blande, tumes alto *Drusorum stemmate*, tamquam
feceris ipse aliquid propter quod nobilis *esses*,
ut te conciperet quae sanguine fulget Juli,
non quae ventoso conducta sub *aggere* texit.

(*b*) Quod modo proposui, non est sententia, verum est:
credite me vobis *folium* recitare *Sibyllae*.
si tibi sancta *cohors comitum*, si nemo tribunal
vendit *acersecomes*, si numen in coniuge crimen
nec per *conventus* et cuncta per oppida curvis
unguibus ire parat nummos raptura *Celaeno*,
tu licet a *Pico* numeres genus.

3. Without translating, comment on the following passages:

(*a*) Ergo supervacua aut perniciosa petuntur?
propter quae fas est genua incerare deorum?

(*b*) 'o fortunatam natam me consule Romam':
Antoni gladios potuit contemnere, si sic
omnia dixisset.

4. Translate, with brief notes:

(*a*) Nunc illud est quom me fuisse quam esse nimio mauelim:

Nunc spes opes auxiliaque a me segregant spernuntque se.
Hic illest dies quom nulla vitae meae salus sperabilist;
Neque exitium exitiost neque adeo spes, quae hunc mi aspellat.
Nec subdolis mendaciis mihi usquam mantellumst meis metum.

(*b*) ERG. Tum denique homines nostra intellegimus bona,
Quom quae in potestate habuimus ea amisimus.
Ego postquam gnatus tuos potitust hostium
Expertus quanti fuerit nunc desiderio.
HE. Alienus quom eius incommodum tam aegre feras,
Quid me patrem par facerest quoi illest unicus?
ERG. Alienus? ego alienus illi? aha, Hegio
Numquam istuc dixis neque animum induxis tuom:
Tibi ille unicust, mi etiam unico magis unicus.
HE. Laudo malum quom amici tuom ducis malum.

(*c*) HE. Iovi deisque ago gratias merito magnas
Quom te redducem tuo patri reddiderunt
Quomque ex miseriis plurimis me exemerunt,
Quae adhuc te carens dum hic fui sustentabam,
Quomque hunc conspicor in potestate nostra
Quomque illaec repertast fides firma nobis.

(*d*) HE. Inicite huic manicas....mastigiae.
TYN. Quid hoc est negoti? quid ego deliqui?
HE. Rogas?
Sator sartorque scelerum et messor maxume.
TYN. Non occatorem dicere audebas prius?
Nam semper occant prius quam sariunt rustici.
HE. Adstringite isti sultis vehementer manus.
TYN. Tuos sum: tu has quidem vel praecidi iube.
Sed quid negotist? quam ob rem suscenses mihi?
HE. Quia me meamque rem, quod in te uno fuit,

5. (*a*) What metres are employed in the dialogue part of the Captives? (*b*) Scan any two lines of 4 (*d*) and write out the scheme of metre of this passage.

B.—JUVENAL AND CICERO.

1. Translate:—

(*a*) Ergo sibi dabit ipse rudem si nostra movebunt
consilia et vitae diversum iter ingredietur
ad pugnam qui rhetorica descendit ab umbra,
summula ne pereat qua vilis tessera venit
frumenti: quippe haec merces lautissima.
Tempta
Chrysogonus quanti doceat vel Pollio quanti
lautorum pueros, artem scindes Theodori.
Balnea sexcentis et pluris porticus in qua
gestetur dominus quoties pluit, anne serenum
exspectet spargatque luto iumenta recenti?
Hic potius namque hic mundae nitet ungula
mulae.
Parte alia longis Numidarum fulta columnis
surgat et algentem rapiat cenatio solem.

(*b*) Servorum ventres modio castigat iniquo
ipse quoque esuriens neque enim omnia sustinet
umquam
mucida caerulei panis consumere frusta,
hesternum solitus medio servare minutal
Septembri, necnon differre in tempora cenae
alterius conchem aestivam cum parte lacerti
signatam vel dimidio putrique siluro.
filaque sectivi numerata includere porri.
invitatus ad haec aliquis de ponte negabit.

2. Translate with one or two words of comment, where necessary:—

(*a*) Corbulo vix ferret tot vasa ingentia.

(*b*) Cavet hunc quem coccina laena
vitari iubet.

(*c*) Si rixa est ubi tu pulsas ego vapulo tautum.

(*d*) Saturarum ego ni pudet illas
adiutor gelidos veniam caligatus in agros.

(*e*) contentusque illic veneto duroque cucullo.

(*f*) Iures licet et Samothracum
et nostrorum aras.

(*g*) Dum superest Lachesi quod torqueat.

3. Translate:

(*a*) Quantum nomen eius fuerit, quantae opes quanta in omni genere bellorum gloria quanti honores populi Romani, quanti senatus quanti tui quis ignorat?

(*b*) Qui autem Domitio poterat esse amicus qui tibi esset inimicus?

(*c*) Quando hoc quisquam ex te, Caesar, audivit aut tua quid aliud arma voluerunt nisi a te contumeliam propulsare? quid egit tuus invictus exercitus nisi ut suum ius tueretur et dignitatem tuam? quid? tu cum pacem esse cupiebas, idne agebas ut tibi cum sceleratis an ut cum bonis civibus conveniret? mihi vero, Caesar, tua in me maxima merita tanta certe non viderentur si me ut sceleratum a te conservatum putarem. quomodo autem tu de re publica bene meritus esses cum tot sceleratos incolumi dignitate esse voluisses?

(*d*) Omnia sunt excitanda tibi, C. Caesar, uni, quae iacere sentis belli ipsius impetu, quod necesse fuit, perculsa atque prostrata, constituenda iudicia, revocanda fides, comprimendae libidines, propaganda suboles, omnia quae dilapsa iam diffluxerunt, severis legibus vincienda sunt. non fuit recusandum in tanto civili bello, tanto animorum ardore et armorum, quin quassata res publica, quicunque belli eventus fuisset, multa perderet et ornamenta dignitatis et praesidia stabilitatis suae multaque uterque dux faceret armatus, quae idem togatus fieri prohibuisset.

Can you mention any examples of questionable Latinity in the Pro Marcello which suggest doubts of the authenticity of the speech?

4. Translate with a very brief comment where necessary:—

(*a*) Mallem ad illum scripsisses mihi illum satisfacere non quo faceret sed ut faceret.

(*b*) Describo et remitto.

(*c*) Nostra miseria tu es magnus.

(*d*) Fufium clamoribus et conviciis et sibilis consectantur.

(*e*) Basilicam habeo non villam frequentia Formianorum.

(*f*) Quamquam licet me Saufeium putes esse nihil me est inertius.

(*g*) Cupio istorum naufragia ex terra intueri.

Can you quite any parallels from poetry?

(*h*) Horum habeo Antii festivam copiam.

(*i*) Dicit enim tanquam in Platonis πολιτείᾳ non tanquam in Romuli faece sententiam.

Who is alluded to?

THIRD AND FOURTH YEARS.

Latin Prose Composition and Translation at Sight.

Friday, April 4th:—Afternoon, 2 to 5.

Write I and II in separate Books.

I.—Latin Prose.

On the death of Philip, Alexander ascended the throne at the age of 20, and found himself surrounded by enemies on every side. He first put down rebellion in his own Kingdom and then marched rapidly into Greece. His unexpected activity overawed all opposition. Thebes, which had been most active against him, submitted when he appeared at its gates; and the assembled Greeks at the Isthmus of Corinth, with the sole exception of the Lacedaemonians, elected him to the command against Persia, which had previously been bestowed upon his father. He now directed his arms against the barbarians of the north, marched across Mount Haemus, defeated the Triballi, and advanced as far as the Danube which he crossed; and on his return, subdued the Illyrians and Taulantii. A report of his death having reached Greece, the Thebans once more took up arms. But a terrible punishment awaited them. He advanced into Boeotia by rapid marches, took Thebes by assault, destroyed all the buildings with the exception of the house of Pindar, killed most of the inhabitants and sold the rest as slaves.

II.—Translation at Sight.

A.

Sunt autem privata nulla natura, sed aut vetere occu-

patione, ut qui quondam in vacua venerunt; aut victoria, ut qui bello potiti sunt; aut lege, pactione, condicione, sorte. Ex quo fit, ut ager Arpinas Arpinatium dicatur, Tusculanus Tusculanorum; similisque est privatarum possessionum descriptio. Ex quo, quia suum cuiusque fit, eorum, quae natura fuerant communia, quod cuique obtigit, id quisque teneat: eo, si qui sibi plus appetet, violabit ius humanae societatis. Sed quoniam, (ut praeclare scriptum est a Platone,) non nobis solum nati sumus, ortusque nostri partem patria vindicat, partem parentes, partem amici; atque, ut placet Stoicis, quae in terris gignantur, ad usum hominum omnia creari, homines autem hominum caussa esse generatos, ut ipsi inter se aliis alii prodesse possent: in hoc naturam debemus ducem sequi, communes utilitates in medium afferre, mutatione officiorum, dando, accipiendo, tum artibus, tum opera, tum facultatibus devincire hominum inter homines societatem. Fundamentum autem iustitiae est fides, id est dictorum conventorumque constantia et veritas. Ex quo quamquam hoc videbitur fortasse cuipiam durius, tamen audeamus imitari Stoicos, qui studiose exquirunt, unde verba sint ducta, credamusque, quia fiat quod dictum est, appellatam fidem.

B.

PHILTO. LYSITELES.

PH. Quo illic homo foras se penetravit ex aedibus.
LY. Pater, adsum: impera quid vis:
Neque tibi ero in mora neque latebrose
Me aps tuo conspectu occultabo.
PH. Feceris par tuis ceteris factis,
Patrem tuom si percoles per pietatem.
Nolo ego cum inprobis te viris, gnate mi,
Neque in via neque in foro necullum sermonem exsequi.
Novi ego hoc saeculum moribus quibus sit:
Malus bonum malum esse volt, ut sit sui similis:
Turbant, miscent mores mali, rapax, avarus, invidus:
Haec ego doleo, haec sunt quae me excruciant,
Haec dies noctis canto tibi caveas.
Hisce ego de artibus gratiam facio,
Ne colas neve inbuas ingenium.
Meo modo et moribus vivito antiquis:
Quae ego tibi praecipio, ea facito.

Nil ego istos moror faeceos mores,
Turbidos, quibus boni dedecorant se.
LY. Semper ego usque ad hanc aetatem ab ineunte adulescentia
Tuis servivi servitutem imperiis, praeceptis, pater.
Pro ingenio ego me liberum esse ratus sum, pro imperio tuo
Meum animum tibi servitutem servire aequam censui.

THIRD AND FOURTH YEARS.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

(Write A and B in separate books.)

A.—ROMAN LIFE AND CHARACTER.

1. Describe the plan of the normal Roman house, and that of the Tragic Poet. Give a full description of the Atrium, its origin and construction.

2. To what extent have we reflected in the ruins of Pompeii the inner and outer life of Rome itself?

3. Describe the manner of the wall decorations, as seen in the House of the Vettii, especially remarking on the Third or Ornate style. Enumerate the leading paintings of this house and describe the mode of their preservation.

4. Remark on the worship of the Lares and of Isis.

5. Write brief notes on the following topics: *conclamatio*, Cinerary Urns, *Basilica*, Trajan's Column, *Apotheosis*, Writing-tablets, Lamps and Lampholders, *tablinum*, Roman Baths.

B.—ROMAN LITERATURE, 31 B.C.—117 A.D.

1. Describe briefly the relation of the different emperors of this period to literature.

2. Give a short life of *either* Lucan *or* Martial.

3. Enumerate the works in the Appendix Vergiliana; with what subjects do they each deal.

4. Comment upon the literary productions of Tacitus, Pliny the Younger, Persius, Tibullus.

5. What works are to be assigned to the following:—Germanicus, Calpurnius, the Emperor Claudius, Phaedrus, Velleius Paterculus, Seneca the Elder, Ovid, Pompeius Trogus.

6. Give a brief criticism of either Horace *or* Livy.

CLASSICAL HONOURS.

Private Readings.

MONDAY, APRIL 14TH:—MORNING, 9 TO 1.

Write C in a separate book.

A. HORACE, EPISTLES I.

1. Translate, with explanatory notes:
   (*a*) Ep. I., 53-61.
   (*b*) Ep. III., 31-36.
   (*c*) Ep. VII., 10-17.
   (*d*) Ep. XIV., 40-44.

2. Translate with brief notes on words italicised:
   (*a*) Quicquid reges *delirant, plectuntur* Achivi.
   (*b*) Non tu corpus *eras* sine *pectore:* di tibi formam, di tibi divitias *dederunt* artemque fruendi.
   (*c*) Locus est et pluribus *umbris.*
   (*d*) Quid censes munera terrae
   quid maris extremos Arabas ditantis et Indos
   ludicra quid plausus et amici dona Quiritis
   quo spectanda modo quo sensu credis et ore

[Punctuate this passage and translate. Give several interpretations, according to the punctuation.]

   (*e*) Haec tibi dictabam post fanum putre *Vacunae, excepto* quod non simul *esses, cetera* laetus.
   (*f*) *Rure* ego viventem, tu dicis in urbe beatum.
   (*g*) Si *pranderet* holus patienter, regibus uti
   nollet *Aristippus.* Si sciret regibus uti,
   fastidiret holus qui me notat. Utrius horum
   verba probes et facta doce, vel iunior audi
   cur sit Aristippi potior sententia. Namque
   mordacem Cynicum sic eludebat, ut aiunt:
   'Scurror ego ipse mihi populo tu: rectius hoc et

splendidius multo est. Equus ut me portet alat rex,
officium facio: tu poscis vilia, verum
dante minor, quamvis fers te *nullius* egentem.

B. VIRGIL, AENEID VI.

3. Translate, with comments:

(*a*) Vss. 30-39.

(*b*) Vss. 740-747.

4. Write brief notes on the following expressions: lucos Triviae: letum Androgeo: euantes orgia: [Cnosius] castigatque auditque dolos: quisque suos patimur manes: viden' ut geminae stant vertice cristae, Et pater ipse suo superum iam signat honore?

C. SALLUST AND CICERO.

1. Translate:—

(*a*) Caesar beneficiis atque munificentia magnus habebatur, integritate vitae Cato. ille mansuetudine et misericordia clarus factus: huic severitas dignitatem addiderat. Caesar dando, sublevando, ignoscendo: Cato nihil largiundo gloriam adeptus est. in altero miseris perfugium erat in altero malis pernicies. illius facilitas huius constantia laudabatur.

(*b*) Sed alia fuere quae illos magnos fecere quae nobis nulla sunt, domi industria, foris justum imperium, animus in consulendo liber, neque delicto neque lubidini obnoxius. pro his nos habemus luxuriam atque avaritiam, publice egestatem privatim opulentiam; laudamus divitias sequimur inertiam; inter bonos et malos discrimen nullum, omnia virtutis praemia ambitio possidet. neque mirum; ubi vos separatim sibi quisque consilium capitis, ubi domi voluptatibus hic pecuniae aut gratiae servitis eo fit ut impetus fiat in vacuam rem publicam.

(*c*) Equidem ego sic existumo, patres conscripti, omnis cruciatus minores quam facinora illorum esse; sed plerique mortales postrema meminere et in hominibus impiis sceleris obliti de poena disserunt si ea paulo severior fuit.

(*d*) Illos dubitando et dies prolatando magnas opportunitates corrumpere; facto non consulto in tali periculo opus esse.

(*e*) Argentum aere solutum est.

(*f*) Igitur colos exsanguis foedi oculi citus modo modo tardus incessus; prorsus in facie voltuque vecordia inerat.

(*g*) Proinde quasi iniuriam facere id demum esset imperio uti.

(*h*) Namque avaritia fidem probitatem ceterasque artes bonas subvortit; pro his superbiam crudelitatem deos neglegere omnia venalia habere edocuit.

(*i*) Ubi de magna virtute et gloria bonorum memores quae sibi quisque facilia factu putat aequo animo accipit, supra ea veluti ficta pro falsis ducit.

2. Translate:

(*a*) Obtinebatur a C. Vergilio quocum me uno vel maxime cum vetustas tum amicitia cum mei fratris conlegia tum rei publicae causa sociarat. What is the subject of *obtinebatur?*

(*b*) Nam maritimos cursus praecludebat hiemis magnitudo.

(*c*) Et ei dices 'quousque' quem negas, quod pro Cispio contenderim, impetrare potuisse! nam istius verbi 'quousque' poterat haec esse invidia: datus est tibi ille, condonatus est ille: non facis finem: ferre non possumus: ei quidem, qui pro uno laborarit, id ipsum non obtinuerit, dici 'quousque' inridentis magis est quam reprehendentis.

(*d*) Quam convenit nondum cognita populi voluntate hos quos iam tum coniunctos fuisse dicis iacturam suarum tribuum, quo vos adiuvaremini, fecisse: eosdem cum iam essent experti quid valerent, restrictos et tenaces fuisse.

(*e*) O adulescentiam traductam eleganter, cui quidem cum quod licuerit obiciatur tamen id ipsum falsum reperiatur.

(*f*) Vitia me hercule Cn. Plancii res eae de quibus dixi tegere potuerunt ne tu in ea vita de qua iam dicam tot et tanta adiumenta huic honori fuisse mirere.

(*g*) Deinde tui municipes sunt illi quidem splendidissimi homines sed tamen pauci si quidem cum Atinatibus conferantur.

A note on each use of quidem.

(*h*) Quare noli me ad contentionem vestrum vocare, Laterensis.

Add a note.

(*i*) Ut fueris dignior quam Plancius de quo ipso tecum ita contendam paulo post ut conservem dignitatem tuam—sed ut fueris dignior non competitor a quo es victus sed populus a quo es praeteritus in culpa est.

THIRD YEAR.

CLASSICAL HONOURS.

UNSEEN TRANSLATIONS.

LATIN.

MONDAY, APRIL 14TH:—AFTERNOON, 2.30 TO 5.30.

Translate:—

1. Potest victoriam malle quam pacem animus: novi spiritus magnos magis quam utiles: et mihi talis aliquando fortuna adfulsit. Quod si in secundis rebus bonam quoque mentem darent dei, non ea solum quae evenissent, sed etiam ea quae evenire possent, reputaremus. Ut omnium obliviscaris aliorum, satis ego documenti in omnes casus sum: quem modo castris inter Anienem atque urbem vestram positis signa inferentem in moenia Romana—hic cernas duobus fratribus, fortissimis viris clarissimis imperatoribus orbatum, ante moenia prope obsessae patriae, quibus terrui vestram urbem, ea pro mea deprecantem. Maximae cuique fortunae minime credendum est: in bonis tuis rebus, nostris dubiis, tibi iam ampla ac speciosa danti est pax, nobis petentibus magis necessaria quam honesta. Melior tutiorque est certa pax quam sperata victoria: haec in tua, illa in deorum manu est: ne tot annorum felicitatem in unius horae dederis discrimen: cum tuas vires, tum vim fortunae Martemque belli communem propone animo: utrimque ferrum, utrimque corpora humana erunt: nusquam minus quam in bello eventus respondent: non tantum ad id, quod data pace iam habere potes, si proelio vinces, gloriae adieceris, quantum ademeris, si quid adversi eveniat.

2. Quod novus et nuper factus tibi praestat amicus
Hoc praestare iubes me, Fabiane, tibi:
Horridus ut primo te semper mane salutem
Per mediumque trahat me tua sella lutum,
Lassus ut in thermas decima vel serius hora
Te sequar Agrippae, cum laver ipse Titi.
Hoc per triginta merui, Fabiane, Decembres,
Ut sim tiro tuae semper amicitiae?
Hoc merui, Fabiane, toga tritaque meaque,
Ut nondum credas me meruisse rudem?

3. Congestis circum lignis accensisque, simul epulantes, ut quisque vino incaluerat, ad pugnam temeritate inani ferebantur. Quippe ipsorum tela per tenebras vana: Romani conspicuam barbarorum aciem, et si quis audacia aut insignibus effulgens, ad ictum destinabant. Intellectum id Civili et restincto igne misceri cuncta tenebris et armis iubet. Tum vero strepitus dissoni, incursus incerti, neque feriendi neque declinandi providentia: unde clamor acciderat, circumagere corpora, tendere artus; nihil prodesse virtus, fors cuncta turbare et ignavorum saepe telis fortissimi cadere. Apud Germanos inconsulta ira: Romanus miles periculorum gnarus ferratas sudes, gravia saxa non forte iaciebat. Ubi sonus molientium aut adpositae scalae hostem in manus dederant, propellere umbone, pilo sequi; multos in moenia egressos pugionibus fodere. Sic exhausta nocte novam aciem dies aperuit.

4. Perstat Echionides, nec iam iubet ire, sed ipse
Vadit, ubi electus facienda ad sacra Cithaeron
Cantibus et clara bacchantum voce sonabat.
Ut fremeit acer equus, cum bellicus aere canoro
Signa dedit tubicen, pugnaeque assumit amorem,
Penthea sic ictus longis ululatibus aether
Movit, et audito clamore recanduit ira.
Monte fere medio est, cingentibus ultima silvis,
Purus ab arboribus spectabilis undique campus.
Hic oculis illum cernentem sacra profanis
Prima videt, prima est insano concita cursu,
Prima suum misso violavit Penthea thyrso
Mater. 'Io, geminae' clamavit 'adeste sorores!
Ille aper, in nostris errat qui maximus agris,
Ille mihi feriendus aper.' Ruit omnis in unum

Turba furens; cunctae coeunt, trepidumque sequuntur,
Iam trepidum, iam verba minus violenta loquentem,
Iam se damnantem, iam se peccasse fatentem.

5. Sic ubi nescio quis Lycia de gente virorum
Rettulit exitium, satyri reminiscitur alter,
Quem Tritoniaca Latous harundine victum
Affecit poena. 'Quid me mihi detrahis?' inquit:
'A! piget, a! non est' clamabat 'tibia tanti!'
Clamanti cutis est summos direpta per artus,
Nec quicquam nisi vulnus erat. Cruor undique manat,
Detectique patent nervi, trepidaeque sine ulla
Pelle micant venae; salientia viscera possis,
Et perlucentes numerare in pectore fibras.
Illum ruricolae, silvarum numina, Fauni
Et satyri fratres et tunc quoque carus Olympus
Et nymphae flerunt, et quisquis montibus illis
Lanigerosque greges armentaque bucera pavit.
Fertilis inmaduit, madefactaque terra caducas
Concepit lacrimas ac venis perbibit imis:
Quas ubi fecit aquam, vacuas, emisit in auras:
Inde petens rapidum ripis declivibus aequor
Marsya nomen habet, Phrygiae liquidissimus amnis.

CLASSICAL HONOURS.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

A. HORACE, ODES I. and III.

1. Translate, with notes:

(*a*) Odes I., XXI.

(*b*) Odes III., VI., 33-48.

2. Translate, explaining the connection of the passage with context:

(*a*) Odi profanum volgus et arceo.
Favete linguis; carmina non prius
Audita Musarum sacerdos
Virginibus puerisque canto.

(*b*) Virtus, repulsae nescia sordidae,
Intaminatis fulget honoribus,
Nec sumit aut ponit secures
Arbitrio popularis aurae.

(*c*) Nuper sollicitum quae mihi taedium,
Nunc desiderium curaque non levis,
Interfusa nitentes
Vites aequora Cycladas.

3. Without translating, write brief notes on italicised words:

(*a*) *Euterpe* cohibet nec *Polyhymnia*
Lesboum refugit tendere barbiton.

(*b*) *Teucer Salamina patremque*
Cum fugeret, tamen uda *Lyaeo*
Tempora populea fertur vinxisse corona
Sic tristes adfatur amicos.

4. Translate:

Frui paratis et valido mihi,
Latoe, dones ac precor integra
Cum mente nec turpem senectam
Degere nec cithara carentem.

5. Describe the metre of 1. (*a*), 2. (*a*), 3. (*b*).

B. Catullus.

6. Translate, commenting on words and phrases in italics:

(*a*) *Phasellus* ille, quem videtis, *hospites*,
Ait fuisse navium *celerrimus*,
Neque ullius natantis impetum trabis
Nequisse praeterire, sine palmulis
Opus foret volare sine linteo.

What different interpretations of this poem have been given?

(*b*) Quod si, ut suspicor, hoc novum ac repertum
Munus dat tibi Sulla litterator,
Non est mi male, sed bene ac beate,
Quod non dispereunt tui labores.
Di magni, horribilem ac sacrum libellum,
Quem tu scilicet ad tuum Catullum
Misti, continuo ut die periret,
Saturnalibus, optimo dierum.

(*c*) Nunc eum volo de tuo ponte mittere pronum,
Si *pote* stolidum repente excitare ueternum

Et supinum animum in gravi derelinquere caeno,
Ferream ut *soleam* tenaci in voragine mula.

Scan the first line of this extract, and name the metre.

(*d*) Iam ver *egelidos* refert tepores,
Iam caeli furor aequinoctialis
Iucundis Zephyri silescit auris.
Iam mens praetrepidans auet vagari.
Iam laeti studio pedes vigescunt.
O dulces comitum valete coetus,
Longe quos simul a domo profectos
Diversae uariae uiae reportant.

What was the occasion and date of this poem?

(*e*) Risi nescio quem modo e corona,
Qui, cum mirifice *Vatiniana*
Meus *crimina Caluus* explicasset,
Admirans ait haec manusque tollens
'Di Magni, salaputium disertum!

(*f*) *Ipsius* at sedes, quacunque opulenta recessit
Regia, fulgenti splendent auro atque argento.
Candet ebur soliis, collucent pocula mensae,
Tota domus gaudet regali splendida gaza.
Pulvinar vero divae geniale locatur
Sedibus in mediis, Indo quod dente politum
Tincta regit roseo conchyli purpura fuco.

(*g*) Sed quid ego a primo digressus carmine plura
Commemorem, ut linquens genitoris filia vultum,
Ut consanguineae complexum, ut denique matris,
Quae misera in gnata deperdita letabatur,
Omnibus his Thesei dulcem praeoptarit amorem,
Aut ut vecta ratis spumosa ad litora Diae
Aut ut eam dulci devinctam lumina somno
Liquerit immemori discedens pectore coniunx?

What emendations have been proposed in these lines?

THIRD YEAR.

CLASSICAL HONOURS.

LATIN.

TACITUS: *Annals*, XIII-XVI; LIVY: *Book*, I.

MONDAY, APRIL 21ST:—MORNING, 9 TO 12.

I. Translate:—

(1) Illic reputans ideo se fallacibus litteris accitam et honore praecipuo habitam, quodque litus iuxta, non ventis acta, non saxis inpulsa navis summa sui parte veluti terrestre machinamentum concidisset, observans etiam Acerroniae necem, simul suum vulnus aspiciens, solum insidiarum remedium esse *sensit*, si non intellegerentur; misitque libertum Agerinum, qui nuntiaret filio benignitate deum et fortuna eius evasisse gravem casum; orare ut quamvis periculo matris exterritus visendi curam differret; sibi ad praesens quiete opus. atque interim securitate simulata medicamina vulneri et fomenta corpori adhibet; testamentum Acerroniae requiri bonaque obsignari iubet, id tantum non per simulationem.

(2) Fuere qui prodita coniuratione, dum auditur Milichus, dum dubitat Scaevinus, hortarentur Pisonem pergere in castra aut rostra escendere studiaque militum et populi temptare. si conatibus eius conscii adgregarentur, secuturos etiam integros; magnamque motae rei famam, quae plurimum in novis consiliis valeret. nihil adversum haec Neroni provisum. etiam fortes viros subitis terreri, nedum ille scaenicus, Tigellino scilicet cum paelicibus suis comitante, arma contra cieret. multa experiendo confieri, quae segnibus ardua videantur, frustra silentium et fidem in tot consciorum animis et corporibus sperare: cruciatui aut praemio cuncta pervia esse. venturos qui ipsum quoque vincirent, postremo indigna nece adficerent. quanto laudabilius periturum, dum amplectitur rem publicam, dum auxilia libertati invocat. miles potius deesset et plebes desereret, dum ipse maioribus, dum posteris, si vita praeriperetur, mortem adprobaret.

II. Translate and comment on:—

(1) Ne tamen ludicrae tantum imperatoris artes notescerent, carminum quoque studium adfectavit, con-

(4) nec rupit tamen fati necessitatem humanis consiliis quin invidia regni etiam inter domesticos infida omnia atque infesta faceret.

(5) Sexto ubi quid vellet parens quidve praeciperet tacitis ambagibus patuit, primores civitatis criminando alios apud populum, alios sua ipsos invidia opportunos interemit.

V. Give the meaning of *novendiale sacrum, clarigatio, pater patratus, tumultuarius miles, suovetaurilia, iusti more belli, aves non admiserunt, supplicationes, pedibus in sententiam ire, arbiter elegantiae, inter reos recipi, abolitio quadragensimae quinquagensimaeque, diurna populi Romani.*

VI. Write a short note on Tacitus as a moralist, and also on what you conceive to have been his political sympathies.

THIRD YEAR.

CLASSICAL HONOURS.

VIRGIL: *Aen. VII., VIII.;* LUCAN: *VI.;* STATIUS: *Thebais, X.*

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Translate:—

(*a*) At specus et Caci detecta adparuit ingens
regia et umbrosae penitus patuere cavernae:
non secus ac si qua penitus vi terra dehiscens
infernas reseret sedes et regna recludat
pallida dis invisa superque inmane barathrum
cernatur trepidentque inmisso lumine Manes.
ergo insperata deprensum in luce repente
inclusumque cavo saxo atque insueta rudentem
desuper Alcides telis premit omniaque arma
advocat et ramis vastisque molaribus instat.
ille autem, neque enim fuga iam super ulla pericli,
faucibus ingentem fumum, mirabile dictu,
evomit involvitque domum caligine caeca,
prospectum eripiens oculis, glomeratque sub antro
fumiferam noctem commixtis igne tenebris.

non tulit Alcides animis seque ipse per ignem
praecipiti iecit saltu qua plurimus undam
fumus agit nebulaque ingens specus aestuat
atra.
hic Cacum in tenebris incendia vana vomentem
corripit in nodum complexus et angit inhaerens
elisos oculos et siccum sanguine guttur.

(*b*) Stat super occiduae nebulosa cubilia noctis
Aethiopasque alios nulli penetrabilis astro
lucus iners subterque cavis grave rupibus an-
trum
it vacuum in montem qua desidis atria Somni
securumque larem segnis Natura locavit.
limen opaca Quies et pigra Oblivio servant
et numquam vigili torpens Ignavia vultu.
otia vestibulo pressisque Silentia pinnis
muta sedent abiguntque truces a culmine ventos
et ramos errare vetant et murmura demunt
alitibus. non hic pelagi licet omnia clament
litora non ullus caeli fragor; ipse profundis
vallibus effugiens speluncae proximus amnis
saxa inter scopulosque tacet: nigrantia circum
armenta, omne solo recubat peclus et nova mar-
cent
gramina terrarumque inclinat spiritus herbas.
mille intus simulacra dei caelaverat ardens
Mulciber: hic haeret lateri redimita Voluptas,
hic comes in requiem vergens Labor; est ubi
Baccho,
est ubi Martigenae socium pulvinar Amori
obtinet; interius tecti in penetralibus altis
et cum Morte iacet nullique ea tristis imago.

Explain Kohlmann's critical note to X 100-105.

2. Translate and explain where necessary:—

(*a*) Exiguo debet quod non est insula colli.

(*b*) Operumque ut summa revisat
defessus Caesar mediis intermanet agris.

(*c*) Et ratibus longae flexus donare Meleae.

(*d*) Pronus ad omne nefas et qui nesciret in armis
quam magnum virtus crimen civilibus esset.

(*e*) Non ira saltem, iuvenes, pietate remota
Stabitis.
(*f*) Infelix quanta dominum virtute parasti.
(*g*) Frangentem fluctus scopulum ferit (sc. mare),
aut latus alti
montis adest seramque sibi parat unda ruinam.
(*h*) Totus mitti civilibus armis
usque vel in pacem potuit cruor.
(*i*) Dolet (sc. Roma) heu semperque
dolebit
quod scelerum, Caesar, prodest tibi summa
tuorum
cum genero pugnasse pio.
(*k*) Pretioque nefandae
lampados Herculeis fortis Meliboea pharetris.
(*l*) Illic quod populos scelerata impegit in arma
divitias numerare datum est.
(*m*) Polluit aequoreos Siculus pirata triumphos.
(*o*) Quarum quidquid non creditur ars est.
(*n*) Aut si quid tacitum sed fas erat.
(*p*) Puppimque ferentes
in ventum tumuere sinus.
(*q*) Maeander direxit aquas.
(*r*) Omne nefas superi prima iam voce precantis
concedunt carmenque timent audire secundum.
(*s*) Hoc casibus eripe iuris
ne subiti caecique ruant.
(*t*) Aut cinis eoa positi phoenicis in ara.
(*u*) A miser extremum cui mortis munus inique
eripitur non posse mori.
(*x*) Eloquar immenso terrae sub pondere quae te
Contineant, Ennaea, dapes.

3. Translate with an explanatory note where necessary:—

(*a*) Proxima Circaeae raduntur litora terrae.
(*b*) Filius huic fato divom prolesque virilis
nulla fuit, primaque oriens erepta iuventa est.
(*c*) Ea vox audita laborum
prima tulit finem primamque loquentis ab ore
eripuit pater.
(*d*) Crateras laeti statuunt et vina coronant.
(*e*) Aurea pectoribus demissa monilia pendent;
tecti auro fulvum mandunt sub dentibus aurum.

(*f*) Quod scelus aut Lapithas tantum aut Calydona merentem?

(*g*) Stupet inscia supra
impubesque manus mirata volubile buxum;
dant animos plagae

(*h*) Nam mihi parta quies omnisque in limine portus
funere felici spolior.

(*i*) At Maiam auditis si quicquam credimus Atlas
idem Atlas generat caelum qui vertice tollit.

(*k*) Aude, hospes, contemnere opes et te quoque dignum
finge deo, rebusque veni non asper egenis.

(*l*) Haud procul inde citae Mettum in diversa quadrigae
distulerant—at tu dictis, Albane, maneres.

(*m*) Tanta mole viri turritis puppibus instant.

4. Quote any lines—not more than 10—from Virgil's description of the Italian heroes who mustered to oppose Aeneas. These lines need not be consecutive.

THIRD YEAR.

CLASSICAL HONOURS.

LATIN PROSE COMPOSITION.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 12.

Translate into Latin:—

A. The tidings of despair, created a terrible commotion in the starving city. There was no hope either in submission or resistance. Massacre or starvation were the only alternative. But if there was no hope within the walls, without there was still a soldier's death. For a moment the garrison and the able-bodied citizens resolved to advance from the gates in a solid column, to cut their way through the enemy's camp, or to perish on the field. It was thought that the helpless and the infirm, who would alone be left in the city, might be treated with indulgence after the fighting men had all been slain. At any rate, by remaining, the strong could neither protect nor comfort them. As soon, however, as this resolve was known there was such wailing and outcry of women and children as pierced the hearts of

the soldiers and burghers, and caused them to forego the project. They felt that it was cowardly not to die in their presence. It was then determined to form all the females, the sick, the aged, and the children, into a square, to surround them with all the able-bodied men who still remained, and thus arranged to fight their way fourth from the gates, and to conquer by the strength of despair, or at least to perish all together.

B. Cato had but one rule of policy, which was to adhere to what was right, without regard to time or circumstances or even to a force that could control him: for, instead of managing the power of the great so as to mitigate the ill or extract any good from it, he was urging it always to acts of violence by a perpetual defiance; so that, with the best intentions in the world, he often did great harm to the republic. This was his general behaviour; yet, from some particular facts explained above, it appears that his strength of mind was not always impregnable, but had its weak places of pride, ambition, and party zeal, which, when flattered and encouraged to a certain point, would betray him sometimes into measures contrary to his ordinary rule of right and truth.

ENGLISH LANGUAGE AND LITERATURE.

FIRST YEAR.

ENGLISH LITERATURE.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 12.

1. For each of the following classes, name one distinguished essayist, and justify your choice by giving some account of his work: The Philosophical Essay, The Political Essay, The Moral Essay, The Critical Essay, The Social Essay.

2. Write on the life, character and work of *one* of the following: Bacon, Swift, Johnson.

3. Of what class of 17th and 18th Century Essays may it be said that it "may rank as an ancestor of the novel?" Name authors and special essays.

4. Between the time of Bacon and Goldsmith the essay advanced immensely in popularity. Account for this.

5. Name the author and give a very brief account of each of the following: An Essay on Projects, The Garden of Cyrus, A Tractate on Education, A Citizen of the World, The Vision of Mirza.

FIRST YEAR.

ENGLISH LANGUAGE AND COMPOSITION.

MONDAY, APRIL 7TH:—AFTERNOON, 2.30 TO 6.

LANGUAGE.

1. Write out the following in Modern English, adding explanatory notes, and giving in each case the approximate date and author's name:—

A.

Vor bote a man conne Frenss, me telth of him lute;
Ac lowe men holdeth to Engliss & to hor owe speche yute.
Ich wene ther ne beth in al the world contreyes none,
That ne holdeth to hor owe speche bote Engelond one.

Ac wel me wot uor to conne bothe wel it is,
Vor the more that a man can, the more wurthe he is.

B.

Englysche men theygh hy hadde fram the bygynnynge thre maner speche, Southeron, Northeron, & Myddel speche (in the myddel of the lond) as hy come of thre maner people of Germania; notheles, by commyxstion & mellynge furst with Danes & afterward with Normans, in menye the contray longage ys apeyred, & som useth strange wlaffynge, chyterynge, harrynge & garrynge & grisbitinge.

C.

Pers mette upon a day
A pore man by the way,
As naked as he was bore,
That yn the se had alle lore
Pers was of reuful herte,
He toke hys kyrtyl of, as smert,
And ded hyt on the man aboue
And bad hym were hyt for hys loue.

D.

Thanne longen folk to gon on pilgrimages
And palmers for to seeken straunge strondes,
To ferne halwes, kouthe in sondry londes,
And specially from every schires ende
Of Engelond, to Caunterbury they wende,
The holy blisful martir for to seeke,
That hem hath holpen when that they were seeke.

E.

And whan Kynge Arthur sawe hym, thenne he said, 'welcome, my systers sone; I wende thou haddest ben dede, and now I see the on lyue, moche am I beholdynge unto Almyghty Jhesu. O fayre neuewe, what ben these ladyes that hydder be come with you.'

F.

He that wyll wryte well in any tongue, must folowe thys council of Arstotle, to speake as the comon people do, to thinke as wise men do. Many English writers haue not done so, but vsinge straunge wordes as latin, french and Italian, do make all thinges darke and harde.

2. Use the above extracts to illustrate the main dif-

ferences between Old and Modern English, and state the most important influences which helped to bring about the changes pointed out.

3. Explain (with examples) what is meant by "Grimm's Law" and "Verner's Law."

4. Draw up tables indicating the relation of English to the principal Indo-European languages.

COMPOSITION.

(Write this part of the paper in a separate book.)

1. Explain briefly, and illustrate:—Simplicity of diction, circumlocution, Latinised phraseology.

2. Discuss with some fulness the question of Barbarism; give illustrations.

3. What is meant by the expression *Unity*, as applied to the structure of a sentence?

4. Write an essay of two pages on any *one* of the following subjects:—

A. A Leader of Nations.
B. London Life, as shown in *The Spectator*.
C. Wireless Telegraphy.

SECOND YEAR.

ENGLISH LITERATURE (Paper I).

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. (*a*) Connect *Beowulf* with history; (*b*) give Ten Brink's theory regarding the growth of the poem in England.

2. Show that the character of Arthur has been exalted and the character of Gawain depressed.

3. Write on the Troy saga.

4. Illustrate mediævalism from Richard Rolle of Hampole; connect him with Germany.

5. Name the works of Dante's Italian trilogy and give some account of the first. Indicate the difference between Dante's cosmogony and Milton's.

6 Select six of Chaucer's pilgrims and exhibit their characteristic features.

7. Write on Ships of Fools and allied literature.

8. Tabulate English and Scotch Chaucerians and name such works of theirs as were discussed in the lectures.

9. Write about a page on any one of the following authors: Roger Bacon, Gower, Lindsay.

SECOND YEAR.

ENGLISH LITERATURE (Paper II).

MONDAY, APRIL 7TH:—AFTERNOON, 2 TO 5.

1. Notice the various pastoral elements which are seen in Spenser's *Shepheardes Calender* and illustrate pastoral constants..

2. What features of our drama are derived from Seneca? Refer each of the more important features to some play.

3. Use Ben Jonson as a describer of the Elizabethan theatre.

4. Connect

(*a*) Love's Labour's Lost and Chapman.

(*b*) Love's Labour's Lost and Puritanism.

Distinguish between Guevarism and Gongorism.

5. Show that Hamlet's monologues mark the main points of the development of the play and point out within the limits of a page the greater outlines of the play's construction.

6. Name "tragedies of revenge" and their writers and give some idea of any one.

7. Write on the Masque.

ESSAY.

(*To be written in a separate book.*)

Write about two pages on one of the following subjects:

Tennyson.

The Study of Literature.

SECOND YEAR (STANSTEAD.)

ENGLISH LITERATURE.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Name four translations by Alfred and give some details concerning one of them.

2. Write a few lines on each of the following: Nigel Wireker, Geoffrey of Monmouth, Layamon, Ormin.

3. Give some account of two of Chaucer's minor poems. Name Chaucerian poets and a work of each.

4. Give some account of two of Spenser's minor poems. Name Spenserian poets and a work of each.

5. Sketch the plot of the Merchant of Venice and interpret its meaning.

6. Classify or give in chronological order Elizabethan and Early Stuart Dramtists (to 1640) and name a play of each.

ESSAY.

(*To be written in a separate book.*)

Write an essay of about two pages on one of the following subjects:

The influence of European Literatures on English.
Tennyson.
The Study of Literature.

SECOND YEAR (STANSTEAD.)

ENGLISH LITERATURE.

MONDAY, APRIL 7TH:—AFTERNOON, 2 TO 4.

1. Sketch the history of the novel in our Literature.

2. Discuss the characteristics of the literature of the period 1660-1760, to the exclusion of fiction.

3. Show that the French Revolution influenced our Literature.

THIRD YEAR.

ENGLISH COMPOSITION.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12

1. Discuss, with illustrations, the question of rhythmical effects in prose style.

2. State, in outline, Taine's theory of criticism; and show clearly in what points it is weak.

3. Distinguish, with examples, between so-called *scientific* criticism, and *aesthetic* criticism.

4. What is meant by the *formal* element in literature? Give ample illustration, and point out clearly the danger of dogmatizing in this connection.

5. Write a dissertation on any one of the following themes:

A. A Theory of Poetic Diction.
B. The Insecurity of Critical Judgment.
C. The Meaning of the term *Classicism*.

THIRD YEAR.

ENGLISH LITERATURE.

THE LATER ELIZABETHAN DRAMA.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

(*Write the answers to questions* 5 *and* 6 *in a separate book.*)

1. Write on Shakspere's use of the supernatural in *Hamlet* and *Macbeth*.

2. Discuss *The Tempest* in relation to (*a*) magic, and (*b*) the New World.

3. "Shakspere gives us the best expressions of the Christian Ideal that are to be met with in poetry." Discuss this statement with special reference to *King Lear*.

4. Compare Shakspere's Roman tragedies with Ben Jonson's.

5. Give Ben Jonson's views regarding the function of a dramatist and the method of his art.

6. State what may be learnt from Ben Jonson's plays concerning (*a*) barbers, (*b*) tobacconists and smoking, (*c*) behaviour in theatres, (*d*) ordinaries.

7. Illustrate methods of dramatic collaboration by references to the works of Jonson, Beaumont, Fletcher, and Massinger.

THIRD YEAR.

ENGLISH LITERATURE.

MONDAY, APRIL 14TH:—AFTERNOON, 2 TO 5.

1. Discuss, with illustrative quotations, the specific qualities of Dryden's satire.

2. Give the general outline of Pope's *pantheistic* position, as stated in *An Essay on Man*.

3. Explain the nature of "mock-heroic" composition: name two noted foreign productions in this category, and state the grounds of special excellence to be found in *The Rape of the Lock*. Support your view with quotations.

4. State clearly, with illustrations, the recognised varieties of rhymed pentameter couplet. Discuss, briefly, the respective adaptibilities of these forms to the expression of special themes.

5. Make some notes on the characteristics of "vers d'occasion," illustrated in Gay and Prior.

6. Contrast the treatment of Nature in Thomson and Cowper.

7. Write a short synopsis (giving illustrations) of the specially poetic qualities of the work of Collins.

FOURTH YEAR.

ENGLISH LITERATURE.

THE POETS OF THE NINETEENTH CENTURY, *(First Paper)*.

TUESDAY, APRIL 1ST:—MORNING, 9 TO 12.

I.

1. Indicate and illustrate the characteristics of the poetical style of Scott.

2. How does Wordsworth indicate the growth of his poetical faculty in the *Prelude?*

3. Give an account of William Taylor of Norwich.

4. Estimate Byron's place in literature. Write on
(*a*) Byron and Pope.
(*b*) *The Giaour* in connection with Rogers and Scott.

5. Give in a tabular form of your own the chief points concerning the French Revolution which were brought forward in the lectures and in a similar way display its immediate influence on English Literature.

6. Give some account of the life of Shelley previous to his expulsion from Oxford. Discuss *The Revolt of Islam* or *The Cenci*.

7. Trace the thought of *In Memoriam* from the defining point to the expression of the belief in Immortality, grounded on Revelation.

8. Choose some matter of literary importance discussed in the lectures, and write about a page on it.

FOURTH YEAR.

ENGLISH LITERATURE.

THE POETS OF THE NINETEENTH CENTURY.

(*Second Paper.*)

TUESDAY, APRIL 8TH:—AFTERNOON, 2 TO 5.

1. Make an analysis of Adonais, and note its various aspects—religious, philosophical and artistic.

2. Write a brief criticism of the poetry of Keats, based on the three poems studied, and illustrated by references to them.

3. Write on Browning as a delineator of character.

4. State in what poems the following extracts occur, and give some idea of the context of any *ten* of them:

(*a*) The mind which is immortal makes itself
Requital for its good or evil thoughts.
(*b*) It was his good angel, who bade him farewell.
(*c*) And drown'd in yonder living blue,
The lark becomes a sightless sound.
(*d*) An ampler ether, a diviner air.
(*e*) And life is thorny and youth is vain.
(*f*) The viewless spirit of a lovely sound,
A living voice, a breathing harmony.
(*g*) How strange now looks the life he makes us lead;

So free we seem, so fettered fast we are.
(*h*) Alas! when passion is both meek and wild!
(*i*) O! Death in Life, the days that are no more.
(*j*) Art and eloquence
And all the shows o' the world are frail and vain
To weep a loss that turns their lights to shade.
(*k*) We have a vision of our own;
Ah! Why should we undo it?
(*l*) Not in the frenzy of a dreamer's eye,
Not in the fabled landscape of a lay.
(*m*) God uses us to help each other so,
Lending our minds out,
(*n*) Oft in my waking dreams do I
Live o'er again that happy hour.
(*o*) Her arm made mockery of the warrior's ramp.
(*p*) The pillar of a people's hope,
The centre of a world's desire.
(*q*) My soul to fancy's fond suggestion yields,
And roams romantic o'er her airy fields.
(*r*) The splendours of the firmament of time
May be eclipsed but are extinguished not.
(*s*) The sickening pang of hope deferr'd,
And memory with a torturing train
Of all his morning visions vain.
(*t*) Swift as a weaver's shuttle fleet our years.
(*u*) Best be yourself, imperial, plain and true.
(*v*) Eternal blessings on the Muse
And her divine employment.
(*w*) Thy voice is on the rolling air;
I hear thee where the waters run.
(*x*) And woven hymns
Of night and day, and the deep heart of man.
(*y*) Thou, silent form, dost tease us out of thought.
(*z*) We receive but what we give
And in our life alone doth Nature live.

FOURTH YEAR.

HISTORY OF ENGLISH FICTION.

TUESDAY, APRIL 8TH:—AFTERNOON, 2 TO 5.

1. State the principal causes contributory to the pro-

duction of novels in England during the eighteenth century, and discuss, with some detail, any *one*.

2. Give some account of the employment of the epistolary form in the writing of English novels. Discuss its advantages and its disadvantages.

3. Make notes on the propensity shown by Richardson to subordinate the art of story-writing to didactic purpose. What was the nature of his teaching? Give specific illustration.

4. What new and original element, or elements, did Smollett introduce into English fiction? Give examples, and state the sources from which they were drawn.

5. Write a short criticism discussing, with the help of examples, the quality of Goldsmith's humour as shown in *The Vicar of Wakefield*.

6. Examine the importance of Scott as a constructor of dramatically coherent plots; and give examples from the Waverley novels. Illustrate with some amount of detail.

7. State fully the new conception introduced into the scheme of the novel by Balzac; and give some idea of the influence of his system and method on subsequent English fiction.

8. Analyze, with some fulness of detail, any *one* leading character (of your own selection) from modern English fiction.

FOURTH YEAR.

COMPOSITION.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

1. Explain carefully the leading ideas involved in Brunetiere's application of the Theory of Evolution to literary processes, forms and products.

2. Apply the scheme of criticism suggested in Question (1) to an example of your own selection.

3. Discuss fully what is meant by a "Theory of Construction" in reference to (*a*) Argumentative Composition, (*b*) Dramatic Composition.

4. What importance is attachable to the distinction between the Matter and the Form of Poetry? Treat this question on an independent basis.

5. Explain the ground of the difficulty experienced in establishing a permanent theory of English prosody.

6. Write a dissertation on any one of the following themes:—

A. The Coherence of Plot in the Drama.
B. The Distinction between the Novel and the Romance.
C. A Criticism of a recent work—(Poetry, Drama, or Fiction).

THIRD YEAR.

ENGLISH HONOURS.

PROSE WRITERS BEFORE DRYDEN.—(*First Paper.*)

Books: More, *Utopia;* Bacon, *New Atlantis;* Lodge, *Rosalynd.*

Monday, April 21st:—Morning, 9 to 12.

1. Write on English Prose Fiction before the Restoration, with particular reference to Malory and Lodge.

2. Show briefly but clearly the part contributed to the development of English prose by each of the following: John Wiclif; Thomas Fisher; Roger Ascham; John Lyly.

3. Comment on More's Platonism; Marriage Laws of the Utopians; Bacon's Style; Occupations in Utopia and in Bensalem; Religious ideals in the two countries.

4. Make brief notes on Amaurot, Anyder, Philarche, Anemolians, Zapoletes.

5. Write briefly on *one* of the following: The value of translation in the formative stage of English prose; The Beginnings of History; The Paston Letters.

THIRD YEAR.

ENGLISH HONOURS.

PROSE WRITERS BEFORE DRYDEN.—(*Second Paper.*)

Books: SIDNEY, *An Apologie for Poetrie;* EARLE, *Microcosmographie;* MILTON, *Areopagitica.*

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

1. Write on the Rise of English Literary Criticism.

2. (*a*) Give in outline Sidney's refutation of the assertion that poetry is "the mother of lies."

(*b*) Make notes on the following: *Sortes Virgilianae;* the Architectonic Science; "the quiddity of *ens* and *prima materia* will hardly agree with a corselet;" Lucan; Sidney's debt to Aristotle.

3. (*a*) Indicate clearly the position of the *Microcosmographie* in the history of English prose.

(*b*) Illustrate the character of the book by writing a short character sketch after the manner of Earle.

4. (*a*) Give the heads of Milton's argument in his *Areopagitica.*

(*b*) In what does the strength of the piece consist? Illustrate by quotation or direct reference.

5. Write on *one* of the following: The Style of Bunyan; Walton as a Biographer; Lord Herbert; The New Prose.

THIRD YEAR.

ENGLISH HONOURS.

MILTON: Shorter Poems and *Paradise Lost*, Bks. I. and II.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. State whence the following extracts are taken and give some idea of their contexts:

(*a*) But then transformed him to a purple flower.

(*b*) The Sun himself withheld his wonted speed.

(*c*) Blest pair of Sirens, pledges of Heaven's joy.

(*d*) Dear son of memory.

(*e*) Showed him his room where he must lodge that night.

(*f*) may thy grave
Peace and quiet ever have!

2. Write on the characteristics of Milton's poetry, early and late.

3. Give the divisions of *L'Allegro* and *Il Penseroso* and an outline of one division in each poem, not being the first or last.

4. Explain the following terms: entertainment, barriers, antimasque, galliards. What allusions to Arcadia occur in *Arcades?* Explain them.

5. (*a*) Show with precision that *Comus* is and is not a masque.

(*b*) *Sec. Bro.* what hidden strength,
Unless the strength of Heaven, if you mean that?
Eld. Bro.—I mean that too, but yet a hidden strength,
Which, if Heaven gave it, may be termed her own.
'Tis chastity....

Give the outline of the remainder of the speech.

6. *Lycidas:* its occasion? its biographical information? the names of its speakers?

Explain five topographical or mythological references in the poem, not touched on in the previous part of your answer.

7. "Things unattempted yet in prose or rhyme." Is this true of *Paradise Lost?*

8. Describe (*a*) the building of Pandemonium.

(*b*) Satan's journey through Chaos.

9. State with precision where the following lines are found, and when spoken; name their speakers:

(*a*) These rest, if any rest can harbour there.

(*b*) I fled and cried out *Death!*

(*c*) and from his horrid hair
Shakes pestilence and war.

(*d*) Abbana and Pharphar, lucid streams.

(*e*) For Eloquence the Soul, Song charms the Sense.
(*f*) Thus repulsed, our final hope
Is flat despair.
(*g*) Awake, arise, or be for ever fallen!
(*h*) Sea-monster, upward man
And downward fish.
(*i*) Advise, if this be worth
Attempting.
(*j*) And Lichas from the top of Œta threw
Into the Euboic sea.

Give the words (or substance) of the contexts of any five.

THIRD YEAR.

ENGLISH HONOURS.

CHAUCER.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 12.

1. Indicate the character and extent of Chaucer's indebtedness to (*a*) Latin, (*b*) French, (*c*) Italian writers.

2. Give detailed accounts of any three pilgrims of the Canterbury Tales.

3. Compare the characters of Palamon and Arcitè and relate their fortunes after they catch sight of Emily.

4. Analyse the openings of the Parlament of Foules and the Hous of Fame so as to bring out points of similarity and difference in the employment of the device of a dream.

5. Explain the following passages, and state clearly their context, giving full particulars as to persons, circumstances, etc.:—

(*a*) It is ful fair to been y-clept "*madame*,"
And goon to vigilyes al bifore,
And have a mantel royalliche y-bore.
(*b*) Hir yelow heer was broyded in a tresse,
Bihinde hir bak, a yerde long, I gesse.
(*c*) A yeer is not so longe to endure.
(*d*) His tipet was ay farsed ful of knyves
And pinnes, for to yeven faire wyves.
(*e*) And ther-with-al he bleynte, and cryde "A!"

(*f*) "Now pees," quod Nature, "I comaunde here."
(*g*) Hir over lippe wyped she so clene,
That in his coppe was no ferthing sene.
(*h*) God help me so, me list ful yvele pleye.
(*i*) And smale harpers with her glees
Seten under hem in sees,
And gonne on hem upward to gape,
And counterfete hem as an ape,
Or as craft countrefeteth kinde.
(*j*) I love hir bet than ye do, by seynt John,
Or atte leste I love hir as wel as ye.
(*k*) He was not pale as a for pyned goost.
A fat swan loved he best of any roost.
His palfrey was as broun as is a berye.
(*l*) Embrouded was he, as it were a mede
Al ful of fresshe floures, whyte and rede.
(*m*) First saw I the destruccioun
Of Troye, through the Greek Sinoun.
(*n*) Ful loude he song, "Com hider, love, to me."
(*o*) He coulde roste, and sethe, and broille, and frye,
Maken mortreux, and wel bake a pye.

THIRD YEAR.

ENGLISH HONOURS.

ANGLO-SAXON. (*Grammar and Philology.*)

FRIDAY, APRIL 4TH:—MORNING, 9 TO 10.15.

1. A. S. *hĕlpan:* why Got. *hilpan?* A. S. *helpan:* why not *healpan?* A. S. *healp* (past tense): why not *halp?* A. S. *holpen* (p. p.) why not *hulpen?* A. S. *ciesth:* why not *ceoseth?*

2. Examine the vowels and diphthongs of the following sets of words and bring them under general laws:

Lat. *ager*, Got. *akrs*, A. S. *æcer.*
Lat. *hortus*, Got. *gards*, A. S. *geard.*
Gk. *oida*, Got. *wait*, A. S. *wat.*
Lat. *augeo*, Got. *aukan*, A. S. *éacan.*
Idg. **bhebhcudhe*, Got. *baud*, A. S. *béad.*
Lat. *mater*, A. S. *modor.*

Prim. Germ. **thanhta*, A. S. *thohte*.

Lat. *vinum*, Got. *wein*, A. S. *win*.

Lat. *mus*, A. S. *mus*.

Lat. *ventus*, A. S. *wind*.

Gk. *pente*, Got. *fimf*, A. S. *fif*.

Lat. *piscis*, Got. *fisks*, A. S. *fisc*.

Apply the laws to Indo-Germanic, Primitive Teutonic and Gothic ablaut-rows.

3. Define and illustrate *svarabhakti*, *affricate*, *i-umlaut*, Verner's law.

4. Decline a masculine *a* and *wa*-stem : a fem. *o*-stem : a monosyllabic neut. *a*-stem (short).

5. Conjugate *céosan* throughout.

THIRD YEAR.

ENGLISH HONOURS.

ANGLO-SAXON (Texts).—(*First Paper.*)

FRIDAY, APRIL 4TH:—MORNING, 10.15 TO 12.

Translate:

(*a*) Ond tha gebead he him hiera agenne dóm feos ond londes, gif hie him thæs rices uthon; ond him cythdon thæt hiera mægas him mid wæron, tha the him from noldon.

(*b*) Ond for thon ic the bebiode thæt thu dó swæ ic geliefe thæt thu wille, thæt thu the thissa woruld-thinga to thæm geæmetige, swæ thu oftost mæge, thæt thu thone wisdom the thé God sealde thær thær thu hiene befæstan mæge, befæste.

(*c*) Suithe ryhtlice hit wæs awriten æfter thæm nitenum thæt tha heargas wæron atiefrede, for tham theah the ful monige mid gerisenlicum weorcum arisen from eorthan, mid ungerisenlicum gewilnungum thissa woroldthinga hie hie selfe alecgeath on eorthan.

(*d*) Nu ic thuss gehroren eam ond aweg-gewiten, hwæt, ge magan on me ongietan ond oncnawan thæt ge nanuht mid eow nabbath fæstes ne stronges thætte thurhwunigean mæge.

(*e*) Tha wæron ægther ge swiftran, ge unwealtran, ge eac hierran thonne tha othru; næron nawther ne on Fresisc gescæpene ne on Denisc, buton swa him sellum thuhte thæt hie nyttwyrthoste beon meahten.

(*f*) Donne mon beam on wuda forbærne, ond weorthe yppe on thone the hit dyde, gielde he ful*l* wite: geselle Lx scillinga; for tham the fyr bith theof.

(*g*) Thæt west andlang stræt on thone æsc. Thæt fram tham æsce andlang stræt betweox tha twegen leas on tha ealdan sealtstræt oth thone steort. Fram tham steorte andlang thæs fulan broces oth Blithan

(*h*) Eft wæs *a*nræd, nalas *e*lnes læt,
*m*ærtha ge*m*yndig *m*æg Hygelaces;
wearp tha *w*undenmæl *w*rættum gebunden
*y*rre *o*retta, thæt hit on *eo*rthan læg,
*st*ith and *st*ylecg; *str*enge getruwode,
*m*undgripe *m*ægenes.

(*i*) Swa *st*emnetton *st*ithhycgende
*h*yssas æt *h*ilde, *h*ogodon georne
hwa thær mid *o*rde *æ*rost mihte
on *f*ægean men*n* *f*eorh gewinnan,
*w*igan mid *w*æpnum; *w*æl feol*l* on eorthan.

(*j*) Gif ic ænegum *th*egne *th*eodenmadmas
*g*eara for*g*e*o*fe, thenden we on than *g*odan rice
ge*s*ælige *s*æton, and hæfdon ure *s*etla geweald,
thonne he me na on *l*eofran tid *l*eanum ne meahte
mine *g*ife *g*yldan, gif his *g*ien wolde

minra *th*egna hwilc ge*th*afa wurthan,
thæt he *u*p heonon *u*te mihte
*c*uman thurh thas *c*lustro and hæfde *c*ræft mid him,
thæt he mid *f*etherhoman *f* leogan meahte,
*w*indan on *w*olcne, thær ge*w*orht stondath
*A*dam and *E*ve on *e*orthrice
mid *w*elan be*w*unden, and we synd a*w*orpene hider
on thas *d*eopan *d*alo.

(*k*) Næs tha *d*ead tha gyt,
*e*alles *o*rsawle: sloh tha *eo*rnoste
*i*des *e*llenrof *o*thre sithe
thone *h*æthenan *h*und, thæt him thæt *h*eafod wand
*f*orth on tha *f*lore; læg se *f*ula leap
*g*esne beæftan, *g*æst ellor hwearf
under *n*eowelne *næss* and thær ge*n*ytherad wæs,
*s*usle ge*s*æled *s*yththan æfre,
*w*yrmum be*w*unden, *w*itum gebunden,
*h*earde ge*h*æfted in *h*ellebryne
æfter *h*insithe. Ne thearf he *h*opian no,
*th*ystrum for*th*ylmed thæt he *th*onan mote
of tham *w*yrmsele, ac thær *w*unian sceal
*a*wa to *a*ldre butan *e*nde forth
in tham *h*eolstran *h*am *h*yhtwynna leas.

Scan the last eight half-verses of ext. (*k*).

THIRD YEAR.

ENGLISH HONOURS.

ANGLO-SAXON (*Unseens*) AND EARLY ENGLISH.

(*Second Paper.*)

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Translate:

(*a*) Tha wæs ymb hundteontig wintra and nigan and hundeahtatig wintra fram Drihtnes menniscnysse,

thæt Seuerus casere, se wæs Æffrica cynnes, of thære byrig the Lepti hatte-se wæs seofonteogetha fram Agusto- hæt he rice onfeng, and thæt hæfde seofontyne year. Thes casere framlice rehte tha cynewisan, ac hwæthere mid gewinne. He com on Breotone mid fyrde, and thær mid myclum and hefegum feohtum mycelne dæl thæs ealondes on anweald onfeng; and hit begyrde and gefæstnade mid dice and mid eorthwealle from sæ to sæ fram othrum elreordum theodum. And he thær on Eororwicceastre adle forthferde; and Basianus his sunu feng to Breotenrice.

O. E. Trans. of Bede. I. 5.

(*b*) Tha cwæth he se ealdorman ond se dema him to: Saga me hwylces hiredes and hwylces cynnes thu si. And tha andswarede him Sanctus Albanus: Hwæt limpeth thæs to the of hwylcum wyrtruman ic acenned si? Ac gif thu wylle gehyran that soth minre æfestnysse thonne wite thu me cristene beon: and ic cristenum thenungum theowian wylle. Tha cwæth he se dema: Gesaga me thinne naman, hwæt thu haten sie. Tha cwæth he: Albanus ic eom geciged fram minum yldrum: and thone sothan God and thone lifigendan, se gescop heofon ond eorthan and ealle gesceafte, ic sterue. and hare ver ne ssel neure by ykuenct. No rearde ne ssel ther by y-hyerd / bote. wo: wo. wo hy habbeth: and wo hy gredeth. The dyeules tormentors pyneth. and tegydere hy byeth ypyned. ne neure ne ssel by ende of pyne; other reste. Thellich is helle / an a thousend zythe worse. And this ich yzeg ine helle / and a thousendzithe more worse. This ich com uor to zygge you.' Slegthe zayth. 'God wet ssolle we do. Nou brothren and zostren y-hyreth my red. and yueth youre. Byeth slege. an waketh ine youre bedes / porueynde guodes. nagt onlyche beuore gode: ac be-uore alle men.'

3. Give some important particulars regarding.
(*a*) *Beowulf* (but not the outline of the story);
(*b*) The Anglo-Saxon Annals;
(*c*) Alfred as a translator.

FOURTH YEAR.

ENGLISH HONOURS.

BROWNING.—(*First Paper.*)

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

Write answers to 1-4 *inclusive in a separate book.*

1. Compare Browning with Tennyson.

2. Give some account of the doctrines of Paracelsus.

3. Give an outline of the lecture on the myth of Christ.

4. Refer the following extracts to their places in *Christmas-Eve* and *Easter Day*, and discuss, when possible, their bearings on the thought of the poems:

(*a*) the sight
Of a sweepy garment, vast and white

(*b*) Trusting its barrenness may smile
With happy foodful green one day

(*c*) A carer for none of it, a Gallio

(*d*) That wrapped right hand which based the chin

(*e*) Prove Jonah's whale translatable
Into some quicksand of the seas

(*f*) Hepzibah Tune

(*g*) And she and I have our reward

(*h*) You leave St. Paul for Æchylus

5. Discuss Browning's theory of poetry, and apply it to his own work.

6. Give the titles of Browning's dramas and indicate the place they occupy in his poetic development. Sketch the plot of one of them.

7. Write on Browning's relation (*a*) to the Romantic Revival; (*b*) to the religious thought of his time.

FOURTH YEAR.

ENGLISH HONOURS.

BROWNING.—(*Second Paper.*)

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

1. Illustrate from Browning's poems (*a*) his love of Italy; (*b*) his Liberalism; (*c*) his knowledge of music; (*d*) his view of love and friendship.

2. Give the titles, and indicate the purport, of the poems in which Browning has taken the art and life of the Renascence as his subject. Make a detailed examination of one of them.

3. Mention the poems in which Browning expresses his devotion to his wife, and discuss one of them at length from the point of view of (*a*) personal reminiscence; (*b*) imaginative presentation.

4. In what poems does Browning refer to contemporary English writers and to what effect?

5. Give instances of Browning's (*a*) lyrical sweetness; (*b*) grotesque use of rhyme; (*c*) employment of odd constructions, words and allusions.

6. Analyse "The Laboratory" so as to bring out Browning's skill in the use of the dramatic monologue.

7. State the precise sources of the following extracts, giving as full particulars as you can of the context in each case:—

(*a*) Let us cry "all good things
Are ours, nor soul helps flesh more, now, than
flesh helps soul!"

(*b*) How brain secretes dog's soul, we'll see!

(*c*) I gave commands;
Then all smiles stopped together.

(*d*) "'Tis only a page that carols unseen,
Crumbling your hawks their messes!"

(*e*) He said, "What's time! Leave Now for dogs and apes!
Man has Forever."

(*f*) Oh, the little more, and how much it is!
And the little less, and what worlds away!

FOURTH YEAR.

ENGLISH HONOURS.

PROSE WRITERS.—(*First Paper.*)

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

1. Discuss the views of Matthew Arnold and Professor Earle as to the early history of English prose.

2. What advances were made in English prose during the century after the Restoration? To what influences are these changes to be ascribed, and with what names are they chiefly connected? Indicate the character or contents of at least one work of each author you mention.

3. Give an account of the struggle for the freedom of the Press in the reign of George III.

4. Review the progress of journalism and periodical literature in the first quarter of the Nineteenth Century.

5. Contrast the styles of DeQuincey and Macaulay so as to bring out the characteristic qualities of each.

FOURTH YEAR.

ENGLISH HONOURS.

PROSE WRITERS.—(*Second Paper.*)

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. Review the influences which have affected prose writers during the reign of Victoria.

2. Illustrate from "Heroes and Hero Worship," Carlyle's leading ideas and the characteristics of his style.

3. Analyse Ruskin's lecture on "Work," and estimate how far his views are due to the influence of Carlyle.

4. State Matthew Arnold's conception of poetry, and show how it affected his estimate of Wordsworth, Byron and Shelley.

5. Give examples from "Virginibus Puerisque" of Stevenson's humour, personal charm, subtlety of thought and expression.

FOURTH YEAR.

ENGLISH HONOURS.

HISTORY OF LITERATURE.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

1. Explain concisely, yet clearly, what is meant by a *literary* influence. Give two *original* examples.

2. In how far may it be said that More's *Utopia* affected the work of Rabelais?

3. State fully the causes which interfered with the direct influence of English literature on Continental European literatures during the fifteenth century.

4. Give some account of the knowledge of English literature shown by (*a*) Saint Evremond, and (*b*) Voltaire. Note carefully the limitations of the latter's literary sympathies and interests.

5. Discuss the effects of the Revocation of the Edict of Nantes in furthering literary relations between England and France.

6. Trace the parallel treatment in *Clarissa Harlowe* and *La Nouvelle Heloise;* and state the principal reasons for the immediate popularity of Richardson in France during the eighteenth century. How late is this influence to be detected?

7. Write a short dissertation on either of the following themes:—

A. The poems of Ossian, and the Nature of their Influence on French Literature.

B. Byron, a European Influence.

HISTORY.

FIRST YEAR.

HISTORY.

MONDAY, APRIL 7TH:—MORNING, 9 TO 11.

Answer any five of the first seven questions. The eighth question is to be answered without alternative.

1. Sketch the war between the Greeks and Persians, 490-470, B.C.; *or* the struggle between the Patricians and Plebeians.

2. Mention the leading features of Roman Imperial History from 100 to 300 A.D. *or* describe the course of the German Inroads, 378-500.

3. Write what you know of Charlemagne's empire *or* of the feudal system.

4. Give a list of the Crusades with a brief comment upon each, *or* show how France became a nation.

5. Describe Luther's part in the Reformation, *or* sketch the career of Philip II of Spain.

6. Outline the main achievements of Louis XIV., *or* those of Frederick the Great.

7. Follow the French Revolution through its principal phases, 1789-1795, *or* describe the creation of the modern German Empire.

8. Make brief notes on: the Phoenicians; the First Punic War; the Flavian emperors; the early conquests of Mohammedanism; the Hussite War; Portuguese discoveries; the dominions of the Emperor Charles V.; the part of Richelieu in the Thirty Years' War; the fall of Charles XII of Sweden; the early victories of Napoleon Bonaparte.

THIRD AND FOURTH YEARS.

HISTORY—(*Paper I.*)

WEDNESDAY, APRIL 9TH:—AFTERNOON, 2 TO 5.

1. Write upon any two of the following subjects:

(*a*) Arianism;
(*b*) the rise and establishment of papal power;
(*c*) the ecclesiastical separation of Eastern and Western Europe—its general and immediate causes.

2. Sketch the political history of Italy from 400 to 600, A.D., bearing in mind both the Roman Empire and the German Inroads.

3. (*a*) Discuss the decline of classical culture in Western Europe.
(*b*) Describe the educational literature and methods of the Dark Ages.

4. Outline the development of either East Francia or West Francia, 843-1000.

5. Explain the theory of the Mediæval Empire.

6. Indicate on the map the location of the following places and districts: Antioch; *Agri Decumates;* Adrianople; Thessalonica; Pollentia; Septimania; Mainz; Soissons; Paderborn; Cis-Jurane Burgundy.

7. Make brief notes on the following subjects: Julian's career in Gaul; German nations in Spain, 415; Gaiseric; Subiaco; the ministers of Justinian; Grimoald; Charles Martel and the Lombards; divisions of the Frankish Empire, 800-840; Hincmar of Reims; monastic services.

THIRD AND FOURTH YEARS.

HISTORY—(*Paper II.*)

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

Answer questions 5, 9 *and* 10, *besides any four of the others.*

1. (*a*) Discuss the differences which exist between mediæval towns in point of origin.
(*b*) Illustrate the development of a spirit of municipal independence.

2. Consider the intellectual aspects of mediæval civilization.

3. Institute a contrast between the leading tendencies of the thirteenth and fourteenth centuries.

4. Give a general account of Italian despotism, and also describe the different forms under which it appears during the period of the Renaissance.

5. What were the main political conditions which affected the progress of the Protestant Revolution from the Wittenberg Theses to the Diet of Augsburg, 1530? In answering this question pay particular attention to the Diet of Worms.

6. Enumerate the causes of the Peasants War in Germany, and describe the character of the contest.

7. What part did Frederick V., Count Palatine, take in the Thirty Years' War, and how were his dominions affected thereby?

8. Answer in detail the following questions: *Why* and *how* was Poland first partitioned?

9. Make brief notes on: Adalbert of Bremen; the attitude of Paschal II. towards Henry V., in 1111; the battle of Courtrai; the financial expedients of Philip the Fair; the crusaders at Zara; the opinions of the Waldenses; Dante's political position; Pope Pius II.; the court of Urbino; the French at Naples.

10. Indicate on the map the location of the following places and districts: Cluny; Canossa; Besançon; Lyons; the land of the Albigenses; Navarre; Aragon; the original grant which was made by Charles the Simple to the Northmen; Apulia; Wittenberg.

THIRD YEAR.

HISTORY. HONOURS.

POLYBIUS, I., II., V.; LIVY, XXI., XXII.; TACITUS: *Annals*, II.; GERMANIA: *Vita Agricolae.*

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

Answer any three of questions 1-4, *any two of questions* 5-7, *and question* 8.

1. Write a short essay on the quality of Polybius as a historian.

2. Enumerate, with details, any successes which the Carthaginians may have gained during the First Punic War. Name their leaders wherever you can.

3. In his second book Polybius dwells on the relations between Macedonia and Greece. Analyze the events which are mentioned in this part of the narrative with a view to explaining the main forces and the main issues which were involved. Name the leaders wherever you can.

4. What do you know of the contest between Antiochus and Ptolemy?

5. What light do these books of Livy throw on the religious ideas and usages of the ancient world?

6. Describe the campaign of Cannae, including in your survey the consequences of the battle.

7. Illustrate the genius of Hannibal as fully as you can by reference to the twenty-first book of Livy.

8. (*a*) What information regarding the relations of Romans and Germans is to be derived from the second book of the *Annals?*

(*b*) What had been the career of Agricola prior to his campaign against the Caledonians?

(*c*) Sketch the social life of the primitive Germans.

THIRD YEAR.

HISTORY HONOURS.—(*Greek Authors.*)

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

Answer seven questions.

Maximum marks for each question the same.

1. Give an account of the battle,
Either of Marathon,
or of Salamis
noting some difficulties in the narrative of Herodotus. In the case of Salamis, refer also to Plutarch.

2. Indicate the attitude of the chief Greek states, respectively in the Persian wars,
(*a*) of 490
(*b*) of 479.

3. Discuss the character and policy of Themistocles, as given in Herodotus, Thucydides, and Plutarch.

4. How does Thucydides present the part played by Pericles, in the Peloponnesian War? Compare the account in Plutarch.

5. State the causes of the failure of the Sicilian expedition.

6. Briefly indicate the position of Thucydides in history, and criticise the device of speeches.

7. Describe the origin and growth of the First state in the "Republic," as far as the introduction of a Guardian class.

8. Point out the most valuable features of Plato's Theory of Education.

9. What elements may be found in the Republic of,
(*a*) Political Science,
(*b*) A Philosophy of History?

THIRD AND FOURTH YEARS.

HISTORY HONOURS.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

Answer any seven questions.

1. Examine carefully that part of Wallenstein's career which lies between the autumn of 1631 and his death.

2. (*a*) Why is Bernard of Saxe-Weimar a notable figure in the history of the Empire?
(*b*) Through what chain of events did he reach his chief importance?

3. (*a*) Sketch the leading characteristics of the French nobility, 1625-1650.
(*b*) How were party lines drawn during the first Fronde?

4. What did the Great Elector do for Brandenburg?

5. (*a*) What is the history of the Olympiad as a chronological unit?
(*b*) How did the Romans reckon time?

(*c*) What is the difference between the Julian Era and the Julian Period?

(*d*) Outline the Arabian system of chronology.

(*e*) Describe the Gregorian reform of the calendar, and give its history.

6. Illustrate the scope and importance of historical geography.

7. (*a*) Subdivide the Slavs, making notes on the history of the different branches where you can.

(*b*) Discuss the work of Cyril and Methodius, indicating the nature of its influence.

8. Show by typical examples that the progress of the fine arts is inseparably connected with the history of civilization,

or,

(*a*) indicate the effect which the methods and spirit of science have produced upon the study of history;

and

(*b*) show how the scientific method has influenced historical composition.

THIRD AND FOURTH YEARS.

HISTORY HONOURS.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. How was the religious situation in Germany modified between the death of Luther and 1580? Give full details wherever you can.

2. Indicate the relation between religious and political motives in the Thirty Years' War—throughout its whole course.

3. Review the foreign relations of France from 1600 to the Treaty of Cherasco.

4. What share, direct or indirect, did the following states have in the Thirty Years' War?

(*a*) Piedmont;

(*b*) Denmark;

(*c*) Poland.

5. Writing from a purely military standpoint, show

the distinctive qualities of the following generals:

(*a*) Ernest of Mansfield;
(*b*) Gustavus Adolphus;
(*c*) Wallenstein;
(*d*) Torstenson;
(*e*) Condé;
(*f*) Turenne.

6. Contrast the situation which existed at the opening of the Diet of Regensburg, 1630, with that which was created by the first battle of Nordlingen.

7. Write short, clear comments upon: Styria and Carinthia; Amberg; Stralsund; Casale; the circles of upper Germany; Gallas; Wittstock; the second battle of Breitenfeld; the mediation which led to the Peace of Westphalia; Trautmannsdorf.

THIRD AND FOURTH YEARS.

HISTORY HONOURS.

FRIDAY, APRIL 4TH:—MORNING, 9 TO 12.

1. Analyze the French Constitution of 1791, and discuss its applicability as an instrument of Government under the circumstances then existing.

2. Trace the course of events in France from the fall of Robespierre to the close of the Convention.

3. Show clearly in tabular outline the successive political redistributions of Europe from the treaty of Campo Formio till the Congress of Vienna inclusive.

4. Summarize the leading events in Italy in the years 1848 and 1849.

5. Outline the successive steps towards the accomplishment of German federation from 1864 till 1871 inclusive.

FOURTH YEAR.

HISTORY HONOURS.

GIBBON: *Decline and Fall,* XLIV., L., LI., LXVI.;
MAHAN: *The Influence of Sea Power on History.*

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. Explain the provisions of the Roman Law with

respect to:

(*a*) the relations of parents and children;
(*b*) testament.

2. Follow out that conflict in the Mohammedan world which is associated with the names of Ali, Moawiyah and Hosein.

3. Describe the Saracenic conquest of Spain.

4. Give some account of the negotiations between Constantinople and the West which were undertaken in the first half of the fifteenth century.

5. Name and discuss the general conditions which affect sea power.

6. Sketch the duel between Suffren and Hughes, *or* show why the movements of DeGrasse in 1781 were of the utmost importance.

7. Illustrate the power and activity of the Dutch fleet in the days of DeRuyter, *or* outline the course of naval operations during the Seven Years' War.

FOURTH YEAR.

HISTORY HONOURS.

BURKE: *Reflections on the French Revolution;* BAGEHOT: *The English Constitution;* LORD ACTON: *German Schools of History.*

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

1. Write some account of:
(*a*) Ranke;
(*b*) Hegel and the Hegelians;
(*c*) Droysen;
(*d*) Roscher.

2. Sketch the working of the cabinet system.

3. Name and discuss the leading functions of the House of Lords.

4. State Burke's views regarding:
(*a*) the French clergy;
(*b*) the confiscation of ecclesiastical property.

5. What does Burke say concerning the following subjects:

(*a*) the attitude of the National Assembly towards the executive power;

(*b*) the military system of revolutionary France?

6. Comment briefly upon following points:

(*a*) Bagehot's references to Prince Albert;
(*b*) the main functions of the House of Commons;
(*c*) the defects of bureaucracy;
(*d*) Burke's allusions to the Declaration of Right;
(*e*) Burke's characterization of Henry the Fourth;
(*f*) canton and commune.

FOURTH YEAR.

HISTORY HONOURS.

MATTHEW ARNOLD: *Pagan and Mediaeval Religious Sentiment;* STUBBS: *Select Charters, Introduction;* BRYCE: *The American Commonwealth.*

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

Answer the first three questions and any five of the others.

1. In what context does Arnold refer to each of the following subjects?

(*a*) Migne's *Patrologia;*
(*b*) St. Francis of Assisi;
(*c*) Heine.

2. Describe the national organization of England from the seventh to the eleventh century.

3. Trace the history of:
(*a*) county representation;
(*b*) borough representation.

4. Outline as distinctly as you can the scheme of the *American Commonwealth,* showing the relation between major and minor subjects.

5. Contrast the true faults of the American democracy with its strength.

6. Treat either of the following subjects:
   (*a*) Wall Street;
   (*b*) American oratory.

7. What are the organs of public opinion in the United States?

8. Why do not the best men go into politics in the United States?

9. Indicate the relations of the two Houses of Congress, *or* write a criticism of the federal system.

10. What do you know of the state executive in the United States?

11. What is the political status of the territories?

12. What are the leading impressions which you have derived from reading the *American Commonwealth?*

FOURTH YEAR.

HISTORY HONOURS.

CLARENDON: *History of the Great Rebellion,* XI.; MACAULAY: *History of England,* III.; LANGLOIS and SEIGNOBOS: *Introduction to the Study of History.*

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 12.

1. What are the main points of contact between English and Scottish affairs in 1648?

2. How does Clarendon treat the following topics?
   (*a*) the trial of Charles I:
   (*b*) the character of Charles I.

3. What was the social status of clergymen in England at the close of the seventeenth century?

4. Name the chief provincial towns of England in the reign of James II., and mention characteristic facts about each one of them.

5. How should the historian proceed to determine particular facts?

6. What do you understand by Heuristic? What processes does it involve?

7. What are the leading principles of Hermeneutic?

8. What are the main results which MM. Langlois and Seignobos reach in their *Conclusion?*

MODERN LANGUAGES.

FIRST YEAR.

FRENCH.—(*First Paper.*)

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Traduire en anglais les extraits suivants et compléter en français les fables d'où ils sont tirés:

(*a*) Deux mulets cheminaient l'un d'avoine chargé
L'autre portant l'argent de la gabelle.
Celui-ci, glorieux d'une charge si belle,
N'eût voulu pour beaucoup en être soulagé.
Il marchait d'un pas relevé,
Et faisait sonner sa sonnette.

(*b*) Compère le renard se mit un jour en frais,
Et retint à dîner commère la cigogne.
Le régal fut petit et sans beaucoup d'apprêts.
Le galant pour toute besogne
Avait un brouet clair; il vivait chichement.

2. Traduire en français:

A nobleman, happening to be near Louis XIV., looked at him so fixedly that the king himself was astonished.

"You look at me very attentively, sir! What is your name?" said the king. "Sire," replied the nobleman, "I am called l'Aigle. Your majesty is aware that only the eagle can look upon the sun without flinching."

The sally is all the happier from the fact that Louis XIV., as everybody knows, had adopted the sun for emblem.

3. Mentionner cinq règles, avec exemples à l'appui, sur l'emploi du subjonctif en français.

4. Indiquer les cas où l'on emploie (*a*) *l'imparfait de l'indicatif*, (*b*) le *préterit*, (*c*) l'auxiliaire *être* et (*d*) l'auxiliaire *avoir*.

5. Distinguer entre:

(*a*) *convenir* avec *avoir* et *convenir* avec *être*, (*b*) *répondre à* et *répondre de*, (*c*) *penser à* et *penser de*, (*d*) *tenir à* et *tenir de* (*e*) *être fâché de* et *être fâché contre*, (*f*) *imposer* et *en imposer*.

6. Traduire en anglais :—

Il s'assit, pour souper, dans un grand fauteuil de chêne noirci, où son père présidait les repas de famille, et sourit en voyant Colomba hésiter à se mettre à table avec lui. Il lui sut bon gré d'ailleurs du silence qu'elle observa pendant le souper et la prompte retraite qu'elle fit ensuite, car il se sentait trop ému pour résister aux attaques qu'elle lui préparait sans doute ; mais Colomba le ménageait et voulait lui laisser le temps de se reconnaître. La tête appuyée sur sa main, il demeura longtemps immobile, repassant dans son esprit les scènes des quinze derniers jours qu'il avait vécu. Il voyait avec effroi cette attente où chacun semblait être de sa conduite à l'égard des Barricini. Déjà il s'apercevait que l'opinion de Pietranera commençait à être pour lui celle du monde. Il devait se venger sous peine de passer pour un lâche. Mais sur qui se venger ?

Colomba.

7. Décrire brièvement le rôle de *Valère* et de *Cléante* dans l'*Avare*.

8. Traduire :—

Harpagon.—Et vous, mon fils le damoiseau, à qui j'ai la bonté de pardonner l'histoire de tantôt, ne vous allez pas aviser non plus de lui faire mauvais visage.

Cléante.—Moi, mon père ? mauvais visage ! Et par quelle raison ?

Harpagon.—Mon Dieu, nous savons le train des enfants dont les pères se remarient, et de quel œil ils ont coutume de regarder ce qu'on appelle belle-mère. Mais si vous souhaitez que je perde le souvenir de votre dernière fredaine, je vous recommande, surtout, de régaler d'un bon visage cette personne-là, et de lui faire enfin tout le meilleur accueil qu'il vous sera possible.

Cléante.—A vous dire le vrai, mon père, je ne puis promettre d'être bien aise qu'elle devienne ma belle-mère. Je mentirais, si je vous le disais ; mais, pour ce qui est de la bien recevoir, et de lui faire bon visage, je vous promets de vous obéir ponctuellement sur ce chapitre.

9. Faire une courte analyse de Mademoiselle de la Seiglière.

FIRST YEAR.

FRENCH.—(*Second Paper.*)

FRIDAY, APRIL 11TH:—AFTERNOON, 2.30 TO 5.30.

Prière de répondre en français.

1. Ecrivez environ 150 mots sur un des sujets suivants:

Chasse aux loups en Russie.

Une répétition au Théâtre Français.

2. Qu'est-ce que Pailleron a voulu peindre dans Le Monde où l'on s'ennuie? Faites connaître le caractère de Bellac, et donnez un court aperçu de la scène dans la serre.

3. Racontez la bataille d'Austerlitz et donnez une appréciation du caractère de Napoléon.

Ou:

Faites connaître la vie et le caractère de Louis IX.

En plus pour les Étudiants des Collèges Affiliés.

Ecrivez environ 400 mots sur la captivité et la mort de Louis XVI.

SECOND YEAR.

FRENCH.—(*First Paper.*)

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

I. Traduire en anglais:

(*a*) Au-dessus et autour de ces deux têtes délicates, pétries dans le bonheur et trempées dans la lumière, le gigantesque avant-train, noir de rouille, presque terrible, tout enchevêtré de courbes et d'angles farouches, s'arrondissait comme un porche de caverne. A quelques pas, accroupie sur le seuil de l'auberge, la mère, femme d'un aspect peu avenant du reste, mais touchante en ce moment-là, balançait les deux enfants au moyen d'une longue ficelle, les couvant des yeux de peur d'accident avec cette expression animale et céleste propre à la maternité; à chaque va-et-vient, les hideux anneaux jetaient un bruit strident qui ressemblait à un cri de colère.

(*b*) Vous vous le figurez,
Seigneur; et, satisfait de quelque résistance,
Vous redoutez un mal faible dans sa naissance;

Mais si dans son devoir votre cœur affermi
Voulait ne point s'entendre avec son ennemi;
Si de vos premiers ans vous consultiez la gloire;
Si vous daigniez, seigneur, rappeler la mémoire
Des vertus d'Octavie indignes de ce prix,
Et de son chaste amour vainqueur de vos mépris;
Surtout si, de Junie évitant la présence,
Vous condamniez vos yeux à quelques jours d'absence,
Croyez-moi, quelque amour qui semble vous charmer,
On n'aime point, seigneur, si l'on ne veut aimer.

II. Traduire en français:

(*a*) Rabbi Joshua, the son of Chananiah, was a very learned and very wise man, but he was ugly. His complexion was so dark that he was nicknamed "The Blacksmith," and little children ran away from him. Yet his wisdom and learning caused him to be esteemed by every one, and even the Emperor Trajan treated him with much consideration. One day, when the Rabbi went to court, the Emperor's daughter laughed at his ugliness, and said, with a smile, "Rabbi, I wonder how it is that such great wisdom as yours should be contained in such an ugly head."

(*b*) Many stories are told of the cleverness of the Cossacks in obtaining what they need for themselves or their horses. Not long ago a Cossack was passing through the streets of Galatz. Suddenly his thin, weary-looking horse fell down and lay apparently lifeless. Its master was moved even to tears, and bewailed the unhappy fate, which had not only deprived him of his favourite companion, but left him horseless just at the most interesting moment of the war.

III. Ecrire une courte appréciation (*a*) du style de Victor Hugo, (*b*) du "règne de l'enfant" dans les œuvres de Victor Hugo, (*c*) du caractère de Néron dans *Britannicus*.

IV. Nommer et classifier les principales œuvres de Victor Hugo.

V. (*a*) Quand le pronom *le* est-il invariable? (*b*) Dans quels cas emploie-t-on le pronom réfléchi *soi?* Exemples.

VI. Quelles sont les règles relatives à l'accord du verbe (*a*) quand les sujets sont unis par la conjonction *ni*, (*b*) la conjonction *ou*, (*c*) après les expressions (1) *plus d'un*, (2) *la plupart*, (3) *peu de*.

VII. Qu'entendez-vous par (*a*) *la langue romane;* (*b*) *la langue d'oc* et *la langue d'oil;* (*c*) *les troubadours*, (*d*) *les jongleurs*, (*e*) *les trouveres?*

VIII. Le théâtre en France—(*a*) son origine, (*b*) associations dramatiques du 15e siècle.

IX. (*a*) Quels sont les principaux prosateurs et poêtes du 16e siècle? (*b*) Courte esquisse biographique de l'un d'eux et appréciation de ses ouvrages.

SECOND YEAR.

FRENCH.—(*Second Paper.*)

FRIDAY, APRIL 11TH:—AFTERNOON, 2 TO 5.

I. Biographie de Victor Hugo.

II. Caractériser deux personnages principaux de Ruy Blas.

III. Dites ce que vous savez sur six des noms historiques suivants en donnant l'époque ou les dates des prinpaux événements:

Saint Louis.
Jean Sans Peur.
Jeanne d'Arc.
Charles le Téméraire.
Henri IV.
Louis XIV.
Mme. de Maintenon.
Le Régent, duc d'Orléans.
Voltaire.

THIRD AND FOURTH YEARS.

FRENCH.

THURSDAY, APRIL 10TH:—AFTERNOON, 2 TO 5.

I. Victor Hugo et le drame romantique.

II. Indiquez les grandes lignes de l'histoire du roman français au XIXe siècle en nommant des représentants dans chaque genre.

THIRD AND FOURTH YEARS.

FRENCH.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

I. (*a*) Décrire les principaux caractères de la littérature française du 18e siècle, en la comparant surtout à celle du 17e; (*b*) mentionner et motiver la division que l'on peut en faire.

II. Le *roman* au 18e siècle: (*a*) raison de son importance, (*b*) écrivains qui s'y distinguent, (*c*) leurs principaux ouvrages en ce genre, (*d*) et donner un aperçu de deux de ces romans.

III. Montesquieu: (*a*) courte esquisse biographique, (*b*) appréciation de son caractère, (*c*) de son œuvre, (*d*) de son influence; (*e*) son style.

IV. (*a*) En quelles catégories peuvent se diviser les œuvres de Voltaire? (*b*) Faire une appréciation de chacune de ces catégories. (*c*) Courte analyse de *Zaire* ou de *Merope*.

V. Faire connaître (*a*) l'opinion de Buffon sur l'origine du globe et des être organisés; (*b*) son système de classification des animaux; (*c*) ses idées sur le style.

VI. (*a*) L'origine, le caractère, le but de l'Encyclopédie; (*b*) la part qu'y prirent d'Alembert, Diderot et Voltaire.

VII (*a*) Donner un aperçu de la *Lettre sur les Spectacles*; (*b*) comment Rousseau y établit-il que le *Misanthrope* de Molière est immoral?

VIII. Caractériser l'éloquence religieuse et parlementaire du 18e siècle et en mentionner les principaux représentants.

IX. (*a*) Analyse du *Barbier de Seville;* (*b*) vie de l'auteur.

FIRST YEAR.

GERMAN.

(Beginners' Class.)

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Translate:—

(*a*) Als Kaiser Rotbart lobesam
Zum heiligen Land gezogen kam,
Da muszt' er mit dem frommen Heer
Durch ein Gebirge, wüst und leer.
Daselbst *erhub* sich grosze Not,
Viel Steine gab's und wenig Brot,
Und mancher deutsche Reitersmann
Hat dort den Trunk sich abgethan.
Nun war ein Herr aus Schwabenland
Von hohem Wuchs und starker Hand,
Des Röszlein war so krank und schwach,
Er zog es nur am Zaume nach;
Er hatt, es nimmer aufgegeben,
Und *kostet's* ihm das eigne Leben.

(*b*) Am andern Tage muszte Reinhardt mit ihm hinaus; auf die Acker, in die Weinberge, in den Hopfengarten, in die Spritfabrik. Es war alles wohl bestellt; die Leute, welche auf dem Felde und bei den Kesseln arbeiteten, hatten ein gesundes und zufriedenes Aussehen. Zu Mittag kam die Familie im Gartensaal zusammen, und der Tag wurde dann, je nach der Musze der Wirte, mehr oder *minder* gemeinschaftlich verlebt.

(*c*) Es ging jetzt fast steil den Berg hinab, sodasz die unten stehenden Bäume wieder Schatten gewährten, zugleich aber die Aussicht auf den See verdeckten, der nur zuweilen zwischen den Lücken der Zweige hindurchblitzte. Bald ging es wieder sanft empor, und nun verschwand rechts und links die Holzung; statt dessen streckten sich dichtbelaubte Weinhügel am Wege entlang; zu beiden Seiten desselben standen blühende Obstbäume voll summender wühlender Bienen.

2. Translate into German:—

(*a*) Many people think they would be contented, if they had a little more money than they now have. (*b*) Whose are those wise words? I do not know, but

they are the words of a man who knew men. (*c*) If you had helped me in my studies I should have helped you in yours. (*d*) Can you come with me to Q. next Thursday? (*e*) With pleasure, if nothing hinders. What day of the month will it be? (*f*) The third of May. We shall start at half past seven in the morning so as to get there before night. (*g*) So much the better: I prefer travelling by day. If you had accompanied (*begleiten*) me on my last journey, you would understand why I say so. (*h*) Please tell me what happened; I suppose you could not sleep, and there was nothing to see when you looked out of the windows. (*i*) No, but the train was thrown off the track (*das Geleise*), because we could not see a tree that had fallen over upon it.

3. Parse fully the words in italics in Question 1, and add any remarks that the forms call for.

4. Explain clearly the German word-order of a sentence introduced (*a*) by *if*, (*b*) by *that*, (*c*) by *because* (*weil* and *denn*). Give short sentences to illustrate.

5. What are the plurals and meanings of:—*Band, Bank, Thor, Mann.*

6. Give *five* superlative forms of *hoch* and explain their use and meaning.

FIRST YEAR.

GERMAN.

(Beginners' Class.)

MONDAY, APRIL 14TH:—AFTERNOON, 2.30 TO 5.30.

1. Translate:—

(*a*) Da erschrack der kleine Muck und bekannte schnell, dasz seine ganze Kunst in den Pantoffeln *liege*, doch lehrte er den König nicht das Geheimnis von dem Umdrehen auf dem Absatz. Von der Neugier getrieben schlüpfte der König selbst in die Pantoffeln, um die Probe zu machen, und sogleich rissen sie ihn mit sich fort, so dasz er wie unsinnig im Garten umherjagte.

Oft *wollte* er *anhalten*, *konnte* aber nicht; und der kleine Muck, der sich diese Rache nicht versagen konnte, *half* ihm nicht, sondern lachte sich ins Fäustchen und *liesz* ihn laufen, bis er atemlos und ohnmächtig *niederfiel*.

(*b*) Ich wanderte auf dem rechten Ufer des Flusses, der in einiger Tiefe und Entfernung unter mir, von reichem Weidengebüsch zum Teil verdeckt, im Sonnenlicht hingleitete. Da *stieg* in mir der alte Wunsch wieder auf, solche Gegenstände würdig nachahmen zu können. Zufällig hatte ich ein schönes Taschenmesser in der linken Hand, und in dem Augenblicke *trat* aus dem tiefsten Grund meiner Seele gleichsam befehlshaberisch hervor; ich sollte dieses Messer ungesäumt in den Flusz schleudern.

2. Translate into German:—

(*a*) The battle (die Schlacht) lasted (dauern) all day, but when evening came, the victory (der Sieg) of the Christian (christlich) army (das Heer) was sure and the Turks (der Türke) had fled. They were pursued (verfolgen) by the Polish (polnisch) cavalry (die Reiterei) for two hours, but the tired (müde) troops (die Truppen) finally had to turn back. On the morning after this great victory, King Sobieski entered (einziehen) into the city. As the heat (die Hitze) was great and the king was tired on account of the fatigues (die Anstrengung) of the previous (vorhergehend) day, he sat down upon a stone to rest a little before he entered the city. Afterwards the name of the king was cut (hauen) into the stone, and it remained there as a lasting (dauernd) memorial (das Denkmal) of that noteworthy (denkwürdig) day.

(*b*) There was once a large round stone near the bridge which goes over the river to St. L. It was placed there in memory of 6,000 poor immigrants (*Einwanderer*) who had died during a plague (*die Seuche*) in the

year 1847. The stone had no names upon it, for one could not have written so many. They were strangers from over the sea, who had come to live in our country. A few years ago this interesting monument was removed and put in (*an*) a place that has nothing to do with its history (*die Geschichte*).

3. Write the infinitive, the 3rd pers. sing., present indic. and the past part. of the verbs in italics in 1 (*a*) and (*b*).

4. Translate (at sight) :—

(*a*) „Wenn es nur das ist," rief das Mädchen fröhlich, „so kann ich ihm vielleicht doch helfen. Der alte Mann schenkte mir ein goldenes Herzchen, und das habe ich sorgfältig verborgen." Als der König das hörte, war er sehr erfreut. „Du bist also das Mädchen mit dem goldenen Herzen, das ich schon so lange suche," rief er. „Keine andere durfte ich zur Königin machen, und deshalb habe ich so lange warten müssen. Es sagten zwar manche, sie hätten ein goldenes Herz, aber wenn man es genauer ansah, so war es doch nicht von wirklichem Golde."

(*b*) Das Winterhalbjahr ging jetzt zu Ende, in welchem der Jüngling viel gearbeitet und wenig gegessen hatte, denn seine tägliche Nahrung seit des Onkels Tode, war, außer am Sonntage, wo er gewöhnlich von seinem Hauswirt zum Mittagessen eingeladen wurde, fast nichts anders gewesen, als Kartoffeln, Brot, und Aepfel. Bei all seiner Sparsamkeit sah er sein Geld schon fast zur Hälfte aufgezehrt ; sollte er jetzt einige Kleidungsstücke sich kaufen, deren er nötig bedurfte, so blieb ihm kaum noch für die nächsten Monate das Notwendigste übrig.

FIRST YEAR.

GERMAN.

MONDAY, APRIL 14TH :—MORNING, 9 TO 12.

N.B.—In place of I. (c) and (d), III. and IV., students of Affiliated Colleges may take V., VI. and VII.

I. Translate into English :

(*a*) Jetzt haßt der Britte die Gefürchtete,

Er wird sie rächen, wenn sie nicht mehr ist,
Nicht mehr die Feindin seines Glaubens, nur
Die Enkeltochter seiner Könige,
Des Hasses Opfer und der Eifersucht
Wird er in der Bejammerten erblicken!
Schnell wirst du die Veränderung erfahren.
Durchziehe London, wenn die blut'ge That
Geschehen, zeige dich dem Volk, das sonst
Sich jubelnd um dich her ergoß, du wirst
Ein andres England sehn, ein andres Volk,
Denn dich umgiebt nicht mehr die herrliche
Gerechtigkeit, die alle Herzen dir
Besiegte! Furcht, die schreckliche Begleitung
Der Tyrannei, wird schaudernd vor dir herziehn
Und jede Straße, wo du gehst, veröden.

(*b*) Du hast das Letzte, Äußerste gethan,
Welch Haupt steht fest, wenn dieses heil'ge fiel!
Man gönnt ihr keinen Anwalt, niemand wagt's,
Zu ihrem Vorteil sprechend, deinem Zorn
Sich bloßzustellen—So vergönne mir,
Dem alten Manne, den am Grabesrand
Kein irdisch Hoffen mehr verführen kann,
Daß ich die Aufgegebene beschütze.
Man soll nicht sagen, daß in deinem Staatsrat
Die Leidenschaft, die Selbstsucht eine Stimme
Gehabt, nur die Barmherzigkeit geschwiegen.
Verbündet hat sich alles wider sie,
Du selber hast ihr Antlitz nie gesehn,
Nichts spricht in deinem Herzen für die Fremde.

Schiller, Maria Stuart.

(*c*) Hinter Nörten stand die Sonne hoch und glänzend am Himmel. Sie meinte es recht ehrlich mit mir und erwärmte mein Haupt, daß alle unreife Gedanken darin zur Vollreife kamen. Die liebe Wirtshaussonne in Nordheim ist auch nicht zu verachten; ich kehrte hier ein, und fand das Mittagessen schon fertig.

Alle Gerichte waren schmackhaft zubereitet, und wollten mir besser behagen als die abgeschmackten akademischen Gerichte, die salzlosen, ledernen Stockfische mit ihrem alten Kohl, die mir in Göttingen vorgesetzt wurden.

(*d*) Liebliche Kühle und träumerisches Quellengemurmel. Hier und da sieht man, wie das Wasser unter den Steinen silberhell hinrieselt und die nackten Baumwurzeln und Fasern bespült. Wenn man sich nach diesem Treiben hinabbeugt, so belauscht man gleichsam die geheime Bildungsgeschichte der Pflanzen und das ruhige Herzklopfen des Berges. In manchen Orten sprudelt das Wasser aus den Steinen und Wurzeln stärker hervor und bildet kleine Kaskaden. Da läßt sich gut sitzen. Es murmelt und rauscht so wunderbar, die Vögel singen angebrochene Sehnsuchtslaute, die Bäume flüstern wie mit tausend Mädchenzungen, wie mit tausend Mädchenaugen schauen uns an die seltsamen Bergblumen, sie strecken nach uns aus die wundersam breiten, drollig gezackten Blätter, spielend flimmern hin und her die lustigen Sonnenstrahlen, die sinnigen Kräutlein erzählen sich grüne Märchen, es ist Alles wie verzaubert, es wird immer heimlicher und heimlicher, ein uralter Traum wird lebendig, die Geliebte erscheint—ach, daß sie so schnell wieder verschwindet!

Heine,—Die Harzreise.

II. Maria Stuart:

(*a*) Show that the conversation between Kent and Davidson in Act II, Scene I, embodies the spirit of the *Roman de la Rose*.

Or

Discuss Schiller's deviations from history. Mention his chief sources of information concerning the Elizabethan period.

(*b*) Comment on:

(1) "Ich sehe diese würd'gen Peers den Glauben viermal ändern;"

(2) "daß dich die Guisen nicht als Königin erkennen."

III. Write on two of the following subjects :

(*a*) Heine's admiration for Napoleon I.

(*b*) Heine as an intellectual intermediary between France and Germany.

(*c*) Heine's wit. Give several good specimens.

(*d*) *Naturbeseelung* in the *Harzreise*.

IV. Die Harzreise. — Comment briefly on four of the following :

(*a*) als ich "konsiliiert" wurde.

(*b*) die Namen aller ordentlichen und unordentlichen Professoren.

(*c*) meine geistreiche Landsmännin, die Baronin Elise von Hohenhausen.

(*d*) einige schlechte Gemälde, worunter auch ein Lucas Cranach sein soll.

(*e*) Der Greifswalder war der Meinung, Deutschland müsse in 33 Gauen geteilt werden.

(*f*) ihr Cavaliere Servente, der geheime Justizrat Cujacius.

FOR AFFILIATED COLLEGES ONLY.

V. Translate into English :

(*a*) Oberst. Mein Herr, was Sie zum Besten Ihrer politischen Tendenzen thun, das mögen Sie thun. Der Professor Oldendorf ist aber in meinem Hause ein gern gesehener Gast gewesen, ich werde nie hinter seinem Rücken gegen ihn arbeiten.— Sie hätten mir diese Stunde erspart, wenn Sie mich nicht früher durch Ihre Versicherungen über die Stimmung der Majorität getäuscht hätten. Indeß zürne ich Ihnen nicht, Sie haben in bester Meinung gehandelt, ich bin davon überzeugt.—Ich bitte die Anwesenden um Entschuldigung, wenn ich mich für heut zurückziehe, ich hoffe Sie morgen wiederzusehen, lieber Senden.

(*b*) Müller (trägt einen kleinen gedeckten Tisch mit Weinflaschen Gläsern und Tellern nach dem Vordergrund links, rückt fünf Stühle, sprechend :) Herr Piepenbrink läßt sich empfehlen und sagen, der Wein wäre von dem gelbgesiegelten, und wenn der

Herr Doctor Gesundheiten tränke, möchte er auch Herrn Piepenbrinks Gesundheit nicht vergessen. Er war sehr fidel, der dicke Herr. Und Madame Piepenbrink erinnerte ihn daran, daß er auf die Union abonnieren sollte: er trug mir auf, das zu bestellen.

(*c*) Bolz (aufstehend). Sie sind sehr gütig, Herr von Senden. Unsere Contracte geben uns das Recht, die Zeitung ganz nach unserem Ermessen zu redigieren und sowohl die Haltung als die Parteistellung des Blattes selbständig zu handhaben. Wir werden daher bis zum Ablauf des nächsten Halbjahrs nicht nur unsere Gehalte fortbeziehen, sondern auch die Zeitung selbst zum Besten der Partei fortführen, welcher anzugehören Sie nicht die Ehre haben.

Die Journalisten.

VI. Describe Freytag's life and literary career previous to the publication of *Die Journalisten*.

VII.—Comment on:

(*a*) das *ist* wenig *gefordert*.

(*b*) *geb*. Melloni aus Paris.

(*c*) Ihre Federn sträuben sich *vor* Ehrfurcht. Give other examples of *vor* with a dative denoting cause.

(*d*) What does Freytag mean to suggest by the position of the infinitive in the following?

Schmock. Könnten Sie mir nicht Beschäftigung *geben* bei Ihrer Zeitung?

(*e*) Give the "principal parts" of the strong verbs in V. (*b*) and (*c*).

FIRST YEAR.

GERMAN.

MONDAY, APRIL 14TH:—AFTERNOON, 2.30 TO 5.30.

I. Translate into English:

(*a*) Doch vor dem hohen Thore, da hält der Sängergreis,
Da faßt er seine Harfe, sie aller Harfen Preis:
An einer Marmorsäule, da hat er sie zerschellt,
Dann ruft er, daß es schaurig durch Schloß und Gärten gellt:

„Weh' euch, ihr stolzen Hallen! Nie töne süßer Klang
Durch eure Räume wieder, nie Saite noch Gesang,
Nein, Seufzer nur und Stöhnen und scheuer Sklavenschritt,
Bis euch zu Schutt und Moder der Rachegeist zertritt!

Uhland, Des Sängers Fluch.

(*b*) Er schwamm langsam hinaus und hob mitunter die Arme aus dem Wasser, daß die herabrieselnden Tropfen im Mondlichte blitzten; aber es war, als ob die Entfernung zwischen ihm und der Blume dieselbe bliebe; nur das Ufer lag, wenn er sich umblickte, in immer ungewisserm Dufte hinter ihm. Endlich war er der Blume so nahe gekommen, daß er die silbernen Blätter deutlich unterscheiden konnte; zugleich aber fühlte er sich in einem Netze verstrickt, die glatten Stengel langten vom Grunde herauf und rankten sich um seine nackten Glieder.

Immensee.

(*c*) Die beiden Brüder rafften die Gerätschaften des Kleinen, die rings zerstreut lagen, wieder zusammen, packten sie in die Mappe, nahmen dann ihre Mützen auf, klopften den Staub davon und wandten sich zum Nachhauseweg. Dieser führte sie an den Fenstern unserer Weinstube vorüber. Ich konnte mir den kleinen tapferen Kerl genauer ansehen; es war wirklich ein Rassegeschöpf.

Wildenbruch, Das Edle Blut.

(*d*) (At sight)

Der alte Rektor stieß einen halbunterdrückten Schreckensruf aus und sprang mit zwei, drei Sätzen den Abhang hinunter, dem Kinde nach. Im Augenblick, da dieses beinahe das Wasser berührte, hatte er es erfaßt und riß es mit krampfhaftem Griffe vom Boden empor. Sobald der Knabe, der von dem plötzlichen Vorgange wie betäubt war, zur Besinnung kam, fing er kläglich zu schreien an. Der Alte setzte ihr auf seinen linken Arm und ließ ihn reiten, und während er langsam die Böschung mit ihm heraufkletterte, zog er sein Taschentuch und wischte dem Kinde die Erde aus den Haaren und dem Gesicht.

Wildenbruch, Der Letzte.

II. Translate into German :

(*a*) ('Retranslation' at sight).

In ancient times, when singers still wandered through the world, two singers once came to a beautiful, lofty castle, surrounded by fragrant gardens. In this castle ruled a rich and proud king. Gloomy and pale he sat; terrible were his thoughts and furious his looks. As the two drew near to the castle, the old man spake to the blooming youth who walked at his side: "Get ready to collect all your force and to strike up your fullest tones. We must select our most moving songs, for the stony heart of this king is not easy to touch."

Now the singers stand in the splendid hall before the terrible king and the mild queen. Wonderfully the old man strikes the chords; richer and richer swells the sound upon the ear, while the clear voice of the youth blends gloriously with the singing of the old man.

(*b*) (At sight).

(1) It would have been pleasanter, however, if we had made the excursion into the country without guides.

(2) No, unfortunately, we must take leave of each other now; I am going at seven o'clock into the town and shall not come back until nine.

(3) William, why could you not have kept silence? You ought not to have told your companion what you think of his plans.

(4) I was not present, because I was unexpectedly called away before the appointed time.

III. Write at some length (*a*) on the various types of word-combination in German; (*b*) on the general relations of High German to Low German; (*c*) on the optative subjunctive (giving good examples).

SECOND YEAR.

GERMAN.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Translate:—

(*a*) Bei dem Kater sasz der Freiherr.
In den Augen zuckt' es oft ihm
Wie ein Blitz—oft wie ein milder
Strahl der untergeh'nden Sonne,
Und er dacht' an alte Zeiten.
Ist es doch des Alters bestes
Labsal, wie von hoher Warte
Rückzuschau'n ins ferne Ehmals.
Und der Greis ist nie alleine.
Ihn umschweben langgestorb'ne
Scharen in vergilbten Wämsern,
In altmod'schem Prachtgewand.
Doch den Moder tilgt Erinn'rung;
Um die Schädel schwingt sich wieder
Jugendfrische, alte Schönheit,
Und sie plaudern von verklung'nen
Tagen, und des Greisen Herz pocht,
Und die Faust ballt oft sich krampfhaft.

(*b*) Aber der treffliche Pfarrer versetzte würdig gesinnt drauf:...

Niemals tadl' ich den Mann, der immer, thätig und rastlos
Umgetrieben, das Meer und alle Straszen der Erde
Kühn und emsig befährt und sich des Gewinnes erfreuet,
Welcher sich reichlich um ihn und um die Seinen herumhäuft,
Aber jener ist auch mir wert, der ruhige Bürger,

Der sein väterlich Erbe mit stillen Schritten umgehet,
Und die Erde besorgt, so wie es die Stunden gebieten.
Glücklich, wem die Natur ein so gestimmtes Gemüt gab!
Er ernähret uns alle. Und Heil dem Bürger des kleinen
Städtchens, welcher ländlich Gewerb mit Bürgergewerb paart!..
Also sprach er. Es trat die Mutter zugleich mit dem Sohn ein.
"Vater," sprach sie, "wie oft gedachten wir untereinander
Schwatzend, des frohlichen Tags, der kommen würde, wenn künftig
Hermann, seine Braut sich erwählend, uns endlich *erfreute!*....
Nun ist er *kommen*, der Tag; es hat sein Herz nun *entschieden*..
Ja, er hat gefühlt und gewählt, und ist männlich *entschieden*.
Jenes Mädchen ist's, die Fremde, die ihm *begegnet*.
Gib sie ihm; oder er bleibt, so schwur er, im ledigen Stande."
(*c*) 'Lebe glücklich,' sagt' er. 'Ich gehe; denn alles bewegt sich
Jetzt auf Erden einmal, es scheint sich alles zu trennen.
Grundgesetze lösen sich auf der festesten Staaten,
Und es löst der Besitz sich los vom alten Besitzer.
Freund sich los von Freund; so löst sich Liebe von Liebe.

Ich verlasse dich hier: und, wo ich jemals dich wieder
Finde, wer weisz es? Vielleicht sind diese Gespräche die letzten....
Aber soll es nicht sein, dasz je wir, aus diesen Gefahren
Glücklich entronnen, uns einst mit *Freuden* wieder umfangen,
O, so erhalte mein schwebendes Bild vor deinen Gedanken,
Dasz du mit gleichem Mute zu Glück und Unglück bereit seist!....

2. Parse the words in italics in 1. (*b*) and (*c*), and comment on them.

3. Explain clearly the context of 1. (*c*) and the allusion in the first five lines of the same extract.

4. Give (*a*) the meaning; (*b*) the force of the prefix and the English cognate, (*c*) a short sentence to illustrate the use of the following verbs:—*aufmachen, besprechen, entführen, entsprechen, entstehen, vergeben, versagen, versprechen, verzeihen, zerbrechen.*

5. When is the German comparative degree formed by the adverb *mehr* instead of the inflexion *-er?* Give several examples.

6. Render idiomatically:—(*a*) It is said to have been he. (*b*) That will not do. (*c*) He claims to know it. (*d*) He sent for both of us. (*e*) Suppose I was wrong, it is all the same to you, is it not? (*f*) Be that as it may, he ought to have been here long ago. (*g*) Werner stood before the Baron, hat in hand. (*h*) That cannot be explained. (*i*) I cannot help it. (*k*) He came running up to me, crying.

7. Translate into German:—

When the Roman (römiſch), ambassador Fabricius was sent to the camp of King Pyrrhus to negotiate (unter-

handeln) with him for (über) peace, the king at first wanted to bribe (bestechen) him with a large sum of money. Not succeeding in this, he thought he could intimidate (einschüchtern) him by placing behind him, without his knowing it, a huge elephant which, at (auf) a given signal, suddenly began to trumpet. But Fabricius calmly looked at the animal and told the king that his elephant frightened him as little as his money had tempted (verlocken) him the day before. He insisted (bestehen) upon the king's evacuating (räumen) Italy; but Pyrrhus would not accept this condition (die Bedingung). In the next battle, however, Pyrrhus lost 13,000 men, and he is said to have exclaimed: "Another such victory would be worse than a defeat." So he sent his friend Cineas, whose eloquence had gained his master more victories than the sword, to offer the Romans terms of peace. When blind Appius heard of it, he had himself carried into the senate and made a speech, in which he declared that Rome should never treat with an enemy who was still unconquered. Soon after P. suffered (erleiden) a complete (vollständig) defeat (die Niederlage) and had to retire in haste to his own country.

SECOND YEAR.

GERMAN.

MONDAY, APRIL 14TH:—AFTERNOON, 2.30 TO 5.30.

1. Translate (at sight):—

(*a*) Gewalt iſt eher mit Gewalt zu vertreiben; aber ein gutgeſinntes, zur Liebe und Teilnahme geneigtes Kind weiß dem Hohn und dem böſen Willen wenig entgegenzuſetzen. Wenn ich die Thätlichkeiten meiner Geſellen ſo ziemlich abzuhalten wußte, ſo war ich doch keineswegs ihren Sticheleien und Mißreden gewachſen, weil in ſolchen Fällen derjenige, der ſich verteidigt, immer verlieren muß. Es wurden alſo

auch Angriffe dieser Art, insofern sie zum Zorn reizten, mit physischen Kräften zurückgewiesen, oder sie regten wundersame Betrachtungen in mir auf, die denn nicht ohne Folgen bleiben konnten. Unter andern Vorzügen mißgönnten mir die Übelwollenden auch, daß ich mir in einem Verhältnis gefiel, welches aus dem Schultheißenamt meines Großvaters für die Familie entsprang: denn indem er als der erste unter seinesgleichen dastand, hatte dieses doch auch auf die Seinigen nicht geringen Einfluß. Und als ich mir einmal nach gehaltenem Gerichte etwas darauf einzubilden schien, meinen Großvater in der Mitte des Rats, eine Stufe höher als die andern, unter dem Bilde des Kaisers gleichsam thronend gesehen zu haben, so sagte einer der Knaben höhnisch: ich sollte doch, wie der Pfau auf seine Füße, so auf meinen Großvater väterlicher Seite hinsehen, welcher Gastgeber zum Weidenhof gewesen und wohl an die Throne und Kronen keinen Anspruch gemacht hätte.

(*b*) Sei mir gegrüßt, mein Berg, mit dem rötlich strahlenden
[Gipfel!
Sei mir, Sonne, gegrüßt, die ihn so lieblich bescheint!
Dich auch grüß' ich, beliebte Flur, euch säuselnde Linden,
Und den fröhlichen Chor, der auf den Ästen sich wiegt,
Ruhige Bläue, dich auch, die unermeßlich sich ausgießt—
Um das braune Gebirg, über den grünenden Wald,
Auch um mich, der, endlich entflohn des Zimmers Gefängnis
Und dem engen Gespräch, freudig sich rettet zu dir.
Deiner Lüfte balsamischer Strom durchrinnt mich erquickend,
Und den durstigen Blick labt das energische Licht.
Frei empfängt mich die Wiese mit weithin verbreitetem Teppich;
Durch ihr freundliches Grün schlingt sich der ländliche Pfad.
Und um mich summt die geschäftige Bien', mit zweifelndem
[Flügel
Wiegt der Schmetterling sich über dem rötlichten Klee.
—Aus Schillers Spaziergang.

2. Write an account *in German* (about 150 words) either of the story on which Gœthe's "Hermann und

Dorothea'' is based, or of Werner's life up to his introduction to the Baron.

3. Give an outline of Gœthe's life, and enumerate the principal works of his last period. Outline the subject of *one*.

4. What is meant by ''Court epic'' and ''Folk epic'' in the first classical period? Compare the two, mention typical works, and give some account of the latter.

5. Give a brief sketch of Scheffel's life. How much of his poem may be called historical?

6. Scan the first two lines of 1 (*b*). What is this metre? Give other examples of it. Compare the German and Latin metres. When did German poetry adopt its present metrical system?

THIRD AND FOURTH YEARS.

GERMAN.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. Translate and comment on the following passages:

(*a*) Bedenke was du thust und was dir nuetzt.
Seitdem der Koenig seinen Sohn verloren,
Vertraut er wenigen der Seinen mehr,
Und diesen wenigen nicht mehr wie sonst.
Missguenstig sieht er jedes Edeln Sohn
Als seines Reiches Folger an, er fuerchtet
Ein einsam huelflos Alter, ja vielleicht
Verwegnen Aufstand und fruehzeitgen Tod.
Der Scythe setzt in's Reden keinen Vorzug,
Am wenigsten der Koenig. Er, der nur
Gewohnt ist zu befehlen und zu thun,
Kennt nicht die Kunst, von weitem ein Gespraech
Nach seiner Absicht langsam fein zu lenken.

(*b*) Sie rissen mich vor den Altar und weihten
Der Goettin dieses Haupt. Sie war versoehnt;
Sie wollte nicht mein Blut und huellte rettend
In eine Wolke mich; in diesem Tempel
Erkannt ich mich zuerst vom Tode wieder.

(*c*) Von dir beruehrt

War ich geheilt; in deinen Armen fasste
Das Uebel mich mit allen seinen Klauen
Zum letzenmal, und schuettelte das Mark
Entsetzlich mir zusammen; dann entfloh's
Wie eine Schlange zu der Hoehle.

(*d*) Ihr habt's nun ueberlegt,
Habt nun gefunden, dass der Patriarch
So unrecht doch nicht hat; dasz Ehr'und Geld
Durch seinen Anschlag zu gewinnen; dasz
Ein Feind ein Feind ist, wenn er unser Engel
Auch siebenmal gewesen waere. Das,
Das habt Ihr nun mit Fleisch und Blut erwogen
Und kommt und tragt euch wieder an. Ach Gott!

(*e*) Es eifre jeder seiner unbestochnen,
Von Vorurtheilen freien Liebe nach!
Es strebe von euch jeder um die Wette,
Die Kraft des Steins in seinem Ring an Tag
Zu legen! komme dieser Kraft mit Sanftmut,
Mit herzlicher Vertraeglichkeit, mit Wohlthun,
Mit innigster Ergebenheit in Gott
Zu Hilf!

(*f*) Ihr Alba
Und Ihr Domingo werden siegreich thronen,
Wo jetzt Ihr Kind im Staub geweint. Die Schaar
Der Hoeflinge, die bebende Grandezza,
Der Moenche suenderbleiche Zunft war Zeuge.
Als Sie mir feierlich Gehoer geschenkt.
Beschaemen Sie mich nicht! So toedtlich, Vater,
Verwunden Sie mich nicht, dem frechen Hohn
Des Hofgesindes schimpflich mich zu opfern,
Dasz Fremdlinge von Ihrer Gnade schwelgen,
Ihr Carlos nichts erbitten kann. Zum Pfande,
Dasz Sie mich ehren wollen, schicken Sie
Mich mit dem Heer nach Flandern!

2. Translate: The Everlasting Burden.

The Caliph Hakkam, who was fond of luxury, wanted to embellish and enlarge the gardens of his palace. He purchased all the neighbouring lands, and paid the owners as much for them as they asked. Only one poor widow was found who would not alienate the inheritance

of her fathers, and refused all offers that were made to her. The overseer of the royal edifices was annoyed at the pertinacity of the widow; he took the small piece of ground by force, and the poor widow went weeping before the judge.

Ibn Beschir happened to be cadi of the town. He heard the case and thought it serious; for, although the widow had the law on her side, it was not easy to induce a sovereign, used to make his will the supreme justice, to conform to an obsolete law.

What did the just cadi do? He saddled an ass, hung a huge sack over his neck, and rode straightway to the gardens of the palace, where he actually found the caliph in the fine building which he had *erected* on the widow's inheritance.

The arrival of the cadi with his ass and sack excited his surprise; and greater still was his astonishment when Ibn Beschir threw himself at his feet and spoke as follows:

'Allow me, my lord, to fill this sack with earth from this ground.'

Hakkam consented. When the sack was full, Ibn Beschir asked the caliph to help him lift the sack on the ass. Hakkam thought this request still more strange than the former one; but in order to see what the cadi was driving at, he gave him a helping hand. But the sack could not be moved.

'The burden is too heavy,' said the caliph.

'Sire,' replied Ibn Beschir, with a generous audacity, 'you find this sack too heavy; you know that it contains but a very small portion of the ground which you have unjustly taken from a poor widow! Do you think you will be able to carry the burden of the whole field when, on the Day of Judgment, the Supreme Judge puts it on your shoulders?'

The caliph stood aghast; but he praised the courage and the sagacity of the cadi, and restored to the widow her inheritance, together with all the buildings which he had caused to be erected on it.

THIRD AND FOURTH YEARS.

GERMAN.

TUESDAY, APRIL 15TH:—AFTERNOON, 2 TO 5.

Credit will be given for answering in German.

1. Klopstock's Messias.
2. Lessing als dramatischer Dichter.
3. Schiller's Kraniche des Ibykus verglichen mit den Gedichten der ersten Periode.
4. Heine und die Romantische Schule.

THIRD AND FOURTH YEARS.

MODERN LANGUAGE HONOURS.

GERMAN.

FAUST.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

1. Die Faustsage.
2. Das religioese Element in Faust's Charakter.
3. Der Goethesche Rettungsplan.
4. Goethe's Faust als Drama.

MODERN LANGUAGE HONOURS.

PHILOLOGIE ROMANE.

MONDAY, APRIL 7TH:— MORNING, 9 TO 12.

1. Traduire en français moderne:

(*a*) Vie de Saint Alexis. Str. 5, 19, 87.

(*b*) Chanson de Roland (éd. Gaston Paris), vers 125-136, 498-510.

2. Donner les *etyma* de tous les mots dans les vers suivants: *Ch. de Roland* (éd. G. Paris), 132, 158, 192, 201, 232, 287, 689, 742.

Vie de Saint Alexis, 4, d; 11, e; 35, d; 92, b; 114, d.

3. Commenter les lettres en italiques dans les mots suivants: pech*i*et, f*ai*te, mi (*c*) nuit, n*ui*t, *h*uit, quer et

car, *il* (nom. plur.), pr*e*ient (prés. ind.), m*ei* et m*e*, m*e*nsem, cal*i*dum et ch*au*d, ensemble, Montréal, q*u*inque, d*e*voir, Lefè*b*vre, sau*l*t, gr*ie*f (gravem), D*e*u (St. Alexis), di*u*rnum et jor*n* (Alexis) et j*ou*r, bries (nom. sing.) et br*e*vem.

4. L'orthographe latine confondait *i. court* et *i. long* (fidem et mille). Le français nous fournit un moyen de distinguer ces deux *i*. Expliquez.

5. Dire pourquoi *e* dans *rem* est traité comme une voyelle *libre*.

6. Donner les lois qui régissent le développement de *e. ferme*, libre et entravé, devant les consonnes nasales.

7. Les principales différences entre le langage de la *Passion*, de l'*Alexis* et du *Rdand*.

8. Enumérer les dialectes provençaux. Qu'est-ce qu'un dialecte?

9. Commenter la prononciation canadienne de *soir, loi,* etc.

MODERN LANGUAGE HONOURS.

FRENCH.—(*Texts.*)

FRIDAY, APRIL 18TH:—AFTERNOON, 2.30 TO 5.30.

1. *Corneille:*—
   (*a*) Analyse de Polyeucte.
   (*b*) Discuter les caractères de Sévère et de Félix.
2. *Moliere:*—
   (*a*) Analyse sommaire du Misanthrope.
   (*b*) La moralité de cette comédie. Justice distributive.
   (*c*) Discuter l'opinion de Rousseau.
3. *Boileau:*—
   (*a*) Quels sont les devanciers de Boileau dans l'*Art Poetique?*
   (*b*) Faire connaître le plan de ce poème.
   (*c*) Citer quelques préceptes de Boileau sur l'art d'écrire.
   (*d*) Analyser et apprécier le Lutrin.

4. *Pascal:*—
   (*a*) Courte esquisse de sa vie.
   (*b*) Quelle fut l'occasion des provinciales?
   (*c*) Quel en était l'objet?

5. *Fenelon:*—
Ses idées sur (*a*) les moyens d'enrichir la langue, (*b*) sur la poésie française, (*c*) sur la comédie et la tragédie, (*d*) sur les Anciens et les Modernes—telles qu'elles se trouvent dans sa *Lettre a l'Academie francaise.*

MODERN LANGUAGE HONOURS.

GERMAN.

THURSDAY, APRIL 17TH:—AFTERNOON, 2.30 TO 5.30.
(*Beantworten Sie beliebige sechs Fragen.*)

1. Uber die Entstehung des "Tasso."

2. Vergleichen Sie den historischen Tasso mit dem des Schauspiels.

3. "Zwei Männer sind's, ich hab' es lang gefühlt,
   Die darum Feinde sind, weil die Natur
   Nicht einen Mann aus ihnen beiden formte."

Erläutern Sie diese Worte. Haben sie irgendwie eine Beziehung auf Goethe selbst?

4. Das Verhältnis der Prinzessin zu Tasso.

5. Ist die 'Braut von Messina' wirklich eine Schicksalstragödie? Begründen Sie ihre Antwort aus dem Verlauf der Handlung.

6. Vergleichen Sie den Chor Schillers mit dem der Griechen.

7. Schiller sagt, die 'Braut von Messina' sei "freie Erfindung" gewesen; in wiefern ist es wahr?

8. Wie vergleicht sich der "Messias" mit Milton's "Paradise Regained." Besprechen Sie den literarischen Wert des deutschen Gedichts.

9. Wieland's "Oberon," dessen Quellen und Inhalt.

THIRD AND FOURTH YEARS.

ITALIAN.

WEDNESDAY, APRIL 2ND:—AFTERNOON, 2.30 TO 5.

1. Translate into English:

I Promessi Sposi, (*a*) Ch. IV., "Il padre Cristoforo da.....tirata di morso."

(*b*) Ch. XIV., "Intanto il sole.....per andare al convento de' cappuccini era troppo tardi."

(*c*) Manzoni, *Il Cinque Maggio*, ll. 1-30.

(*d*) (at sight) Cavour, *Discorso alla Camera dei Deputati nella seduta del 25 marzo*, 1861, "A prova.....fra le varie parti d'Italia." (D'Ancona e Bacci, Vol. V., p. 528).

(*e*) (at sight) Massimo D'Azeglio, *Colloquio con Carlo Alberto*. Domandai un' udienza.....arditi progetti. (D'Ancona e Bacci, Vol. V., p. 411).

THIRD AND FOURTH YEARS.

ITALIAN.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. Translate into English:

Inferno, (*a*) Canto II., ll. 1-30, and (*b*) Canto XI., ll. 1-24.

2. Quote the words over the gate of Hell, *or* Dante's denunciation of those spirits who "*visser senza infamia et senza lodo.*"

3. Comment on the following:

Inferno, Canto II., l. 21, empireo Ciel; l. 28, lo Vas d'elezione; ll. 97 and 102, Lucia and Rachele.

4. Give Dante's description of Homer in Canto IV. What poets are mentioned as his following?

5. Explain the connection between the political and religious symbolism of the *Commedia*.

6. Translate into Italian:

(*a*) Have you ever gone to Milan? Have you ever experienced the sorrow of leaving your home; of waking

up in a furnished room, where you hear only the mechanical jingle of your alarm clock, and where you see nothing but your fireless hearth; of waiting for the loved faces which you will never see; of dining alone, without joy, without excitement, in a lonely eating-house, where all your emotions die away in your heart for want of expression; of setting out at seven, never accompanied, to go to the *café* or to the theatre, and of returning alone at ten to your little, deserted room, cold and sad as your solitary life.

(*b*) It seems that I have no great ability. In my school reminiscences I find many punishments, many complaints from the masters to my uncle, many books spoiled, caricatures of the teachers, novels read secretly and lessons missed openly; but no prizes, no certificates of merit, no interest in study. When I left the technical schools, I knew several cantos of Ariosto by heart, recited a number of stories from the Decameron very well and, with regard to modern literature, had certain very clear opinions formed by personal judgment without the help of masters.

7. Give examples of the subjunctive mood (*a*) with indefinite pronouns, (*b*) in clauses "dependent on a verb of saying," (*c*) when used to express a wish not likely to be realized.

8. Give the pres. ind. of andare, vedere, dovere; the preterite of ricevere, volere; the pres. subj. of tenere, udire.

SEMITIC LANGUAGES.

SECOND YEAR

HEBREW.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. Translate literally—Genesis VI, 5 to 8.

וַיַּרְא יְהוָה כִּי רַבָּה רָעַת הָאָדָם בָּאָרֶץ וְכָל־יֵצֶר מַחְשְׁבֹת
לִבּוֹ רַק רַע כָּל־הַיּוֹם : וַיִּנָּחֶם יְהוָה כִּי־עָשָׂה אֶת־הָאָדָם
בָּאָרֶץ וַיִּתְעַצֵּב אֶל־לִבּוֹ : וַיֹּאמֶר יְהוָה אֶמְחֶה אֶת־הָאָדָם
אֲשֶׁר־בָּרָאתִי מֵעַל פְּנֵי הָאֲדָמָה מֵאָדָם עַד־בְּהֵמָה
עַד־רֶמֶשׂ וְעַד־עוֹף הַשָּׁמָיִם כִּי נִחַמְתִּי כִּי עֲשִׂיתָם :
וְנֹחַ מָצָא חֵן בְּעֵינֵי יְהוָה :

(*a*) Parse fully (1) וַיַּרְא (2) רַבָּה (3) וַיִּנָּחֶם (4) אֶמְחֶה.

(*b*) Name the accents in the first sentence, and point out their use.

(*c*) Inflect the Piel perfect of נָחַם.

(*d*) Render into Hebrew:—You (masc) have found grace in the eyes of the Lord.

2. Translate literally—Exodus XX, 1 to 6.

וַיְדַבֵּר אֱלֹהִים אֵת כָּל־הַדְּבָרִים הָאֵלֶּה לֵאמֹר : ס
אָנֹכִי יְהוָה אֱלֹהֶיךָ אֲשֶׁר הוֹצֵאתִיךָ מֵאֶרֶץ מִצְרַיִם
מִבֵּית עֲבָדִים : לֹא־יִהְיֶה לְךָ אֱלֹהִים אֲחֵרִים עַל־פָּנָי : לֹא־
תַעֲשֶׂה לְךָ פֶסֶל ו וְכָל־תְּמוּנָה אֲשֶׁר בַּשָּׁמַיִם ו מִמַּעַל וַאֲשֶׁר
בָּאָרֶץ מִתָּחַת וַאֲשֶׁר בַּמַּיִם ו מִתַּחַת לָאָרֶץ : לֹא־תִשְׁתַּחֲוֶה
לָהֶם וְלֹא תָעָבְדֵם כִּי אָנֹכִי יְהוָה אֱלֹהֶיךָ אֵל קַנָּא פֹּקֵד עֲוֹן
אָבֹת עַל־בָּנִים עַל־שִׁלֵּשִׁים וְעַל־רִבֵּעִים לְשֹׂנְאָי : וְעֹשֶׂה
חֶסֶד לַאֲלָפִים לְאֹהֲבַי וּלְשֹׁמְרֵי מִצְוֹתָי :

(*a*) Make notes on:—(1) פֶּסֶל (2) תְּמוּנָה (3) מִצְרַיִם.

(*b*) Parse (1) הוֹצֵאתִיךָ (2) תָּעְבְּדֵם (3) לְשׁנְאָי.

(*c*) Inflect fully עָבַד.

4. Translate with notes—Psalm II, 7 to 12.

אֲסַפְּרָה אֶל־חֹק יְהוָה אָמַר אֵלַי בְּנִי אַתָּה אֲנִי הַיּוֹם יְלִדְתִּיךָ׃
שְׁאַל מִמֶּנִּי וְאֶתְּנָה גּוֹיִם נַחֲלָתֶךָ וַאֲחֻזָּתְךָ אַפְסֵי־אָרֶץ׃
תְּרֹעֵם בְּשֵׁבֶט בַּרְזֶל כִּכְלִי יוֹצֵר תְּנַפְּצֵם׃ וְעַתָּה מְלָכִים
הַשְׂכִּילוּ הִוָּסְרוּ שֹׁפְטֵי אָרֶץ׃ עִבְדוּ אֶת־יְהוָה בְּיִרְאָה וְגִילוּ
בִרְעָדָה׃ נַשְּׁקוּ־בַר פֶּן־יֶאֱנַף וְתֹאבְדוּ דָּרֶךְ כִּי־יִבְעַר כִּמְעַט
אַפּוֹ אַשְׁרֵי כָל־חוֹסֵי בוֹ׃

5. Render into Hebrew:—(1) I shall put forth my hand and take the fruit and eat. (2) Did not God say, let there be light?

6. Qal Infinitive const. of verbs פ״ן.

7. ו of Verbs פ״ן in Qal imperfect.

8. The Hiphil perfect of verbs ע״ע.

9. Explain the following Masoretic signs: –ב״א–סמס–פפפ –פרק–פרשיות–סימן–חזק–נ״א–ב״נ.

THIRD AND FOURTH YEARS.

HEBREW.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

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1. Translate with notes—(*a*) Isaiah VII, 14 to 16.

לָכֵן יִתֵּן אֲדֹנָי הוּא לָכֶם אוֹת הִנֵּה הָעַלְמָה הָרָה וְיֹלֶדֶת בֵּן
וְקָרְאת שְׁמוֹ עִמָּנוּאֵל׃ חֶמְאָה וּדְבַשׁ יֹאכֵל לְדַעְתּוֹ מָאוֹס

בָּרָע וּבָחוֹר בַּטּוֹב : כִּי בְטֶרֶם יֵדַע הַנַּעַר מָאוֹס בָּרָע וּבָחוֹר
בַּטּוֹב תֵּעָזֵב הָאֲדָמָה אֲשֶׁר־אַתָּה קָץ מִפְּנֵי שְׁנֵי מְלָכֶיהָ :

(*b*) Isaiah LIII, 8 to 10.

מֵעֹצֶר וּמִמִּשְׁפָּט לֻקָּח וְאֶת־דּוֹרוֹ מִי יְשׂוֹחֵחַ כִּי נִגְזַר
מֵאֶרֶץ חַיִּים מִפֶּשַׁע עַמִּי נֶגַע לָמוֹ : וַיִּתֵּן אֶת־רְשָׁעִים
קִבְרוֹ וְאֶת־עָשִׁיר בְּמֹתָיו עַל לֹא־חָמָס עָשָׂה וְלֹא מִרְמָה
בְּפִיו : וַיהוָה חָפֵץ דַּכְּאוֹ הֶחֱלִי אִם־תָּשִׂים אָשָׁם נַפְשׁוֹ
יִרְאֶה זֶרַע יַאֲרִיךְ יָמִים וְחֵפֶץ יְהוָה בְּיָדוֹ יִצְלָח :

2. Translate—Ecclesiastes XII, 1 to 6.

וּזְכֹר אֶת־בּוֹרְאֶיךָ בִּימֵי בְחוּרוֹתֶיךָ עַד אֲשֶׁר לֹא־יָבֹאוּ יְמֵי
הָרָעָה וְהִגִּיעוּ שָׁנִים אֲשֶׁר תֹּאמַר אֵין־לִי בָהֶם חֵפֶץ : עַד
אֲשֶׁר לֹא־תֶחְשַׁךְ הַשֶּׁמֶשׁ וְהָאוֹר וְהַיָּרֵחַ וְהַכּוֹכָבִים וְשָׁבוּ
הֶעָבִים אַחַר הַגָּשֶׁם : בְּיוֹם שֶׁיָּזֻעוּ שֹׁמְרֵי הַבַּיִת וְהִתְעַוְּתוּ
אַנְשֵׁי הֶחָיִל וּבָטְלוּ הַטֹּחֲנוֹת כִּי מִעֵטוּ וְחָשְׁכוּ הָרֹאוֹת
בָּאֲרֻבּוֹת : וְסָגְרוּ דְלָתַיִם בַּשּׁוּק בִּשְׁפַל קוֹל הַטַּחֲנָה וְיָקוּם
לְקוֹל הַצִּפּוֹר וְיִשַּׁחוּ כָּל־בְּנוֹת הַשִּׁיר : גַּם מִגָּבֹהַּ יִרָּאוּ
וְחַתְחִתִּים בַּדָּרֶךְ וְיָנֵאץ הַשָּׁקֵד וְיִסְתַּבֵּל הֶחָגָב וְתָפֵר
הָאֲבִיוֹנָה כִּי־הֹלֵךְ הָאָדָם אֶל־בֵּית עֹלָמוֹ וְסָבְבוּ בַשּׁוּק
הַסּוֹפְדִים :

(*a*) Parse the weak verbs in the last sentence.
(*b*) Comment on that passage.

3. Translate—Psalm XLII, 1 to 4.

לַמְנַצֵּחַ מַשְׂכִּיל לִבְנֵי־קֹרַח : כְּאַיָּל תַּעֲרֹג עַל־
אֲפִיקֵי־מָיִם כֵּן נַפְשִׁי תַעֲרֹג אֵלֶיךָ אֱלֹהִים : צָמְאָה נַפְשִׁי
לֵאלֹהִים לְאֵל חָי מָתַי אָבוֹא וְאֵרָאֶה פְּנֵי אֱלֹהִים :

(*a*) Make short notes on (1) לַמְנַצֵּחַ (2) מַשְׂכִּיל (3) קֹרַח.

(*b*) Inflect the Niphal imperfect of רָאָה.

(*c*) Inflect fully לֶחֶם.

4. Point, translate and explain the following—נ״א, רבתי, יתקק, יתיר.

5. Point out traces of Aramaisms in Koheleth.

6. What are the main differences between Hebrew and Aramaic verbs?

7. Describe the system of writing in Assyrian.

8. (*a*) The language of the Talmud. (*b*) The Mishna and the Gemara. (*c*) The six orders of the Mishna. (*d*) General contents of the Pirke Aboth.

9. The inscription of Mesha.

MENTAL AND MORAL PHILOSOPHY.

SECOND YEAR.

LOGIC.

Answer eight questions. Questions 5 *and* 9 *must be attempted by all.*

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. State the fundamental Principles of Logic and explain their significance.

2. *Either* explain (with illustrations) the meaning of the Predicables: *or* define Philosophy, University, Syllogism, and examine the following definitions:

(*a*) Opposed propositions are those which differ in quantity and quality.

(*b*) Logic is a guide to correct reasoning.

(*c*) Man is a self-knowing animal.

(*d*) Parallel lines are lines of similar direction.

3. Give the Square of Opposition, explain its meaning with an example of each kind of proposition.

4. Write a note on the Distribution of Terms and show in what way each class of proposition can be *converted*.

5. *Either* prove (*a*) that from two particular premises no syllogistic inference is possible; and (*b*) that in the first figure the major premise must be universal: *or* answer the following questions: If the minor premise in the first figure were not affirmative what fallacy would be committed? Why is *OAO* excluded from the first and second figures? Why must the conclusion in the third figure be particular?

6. (*a*) Does the Syllogism involve a *petitio principii?*

(*b*) Is the Syllogism the only type of valid mediate inference?

7. Test the validity of the following inferences:

(*a*) He who is content with what he has is truly rich; a covetous man is not content with what he has, hence no covetous man is truly rich.

(*b*) Protection from punishment is plainly due to the innocent, and therefore as you maintain that this person ought not to be punished, it appears you are convinced of his innocence.

(*c*) The ground is wet if rain has fallen, the ground is wet, therefore rain has fallen. If the ground is wet, rain has fallen, but rain has fallen, therefore the ground is wet.

(*d*) Who spareth the rod, hateth his child; the parent who loveth his child, therefore, spareth not the rod.

8. *Either* explain with illustrations: A dicto secundum quid ad dictum simpliciter, Petitio Principii, Post hoc ergo Propter hoc; *or* discuss (*a*) the question of the burden of proof, and (*b*) the main objections urged against the Science of Logic.

9. Examine the cogency of the following:

(*a*) The *minimum visible* is the least magnitude which can be seen: no part of it alone is visible and yet all parts of it must affect the mind in order that it may be visible; hence every part of it must affect the mind without being visible.

(*b*) Truth and sincerity are very precious things are they not?

Yes, truly, I think of all things the most precious.

And do we not generally keep our most precious gifts for our friends alone?

No doubt we do.

You will not deny then, that truth and sincerity should be given to our friends?

Certainly we ought to give them to those we love.

Ought we not also to deny them to our enemies?

It certainly seems so from the argument; but I like not this conclusion.

Plato.

(*c*) Nothing can be more obvious than that all animals were created solely and exclusively for the use of man.

"Even the tiger that devours him?" said Mr. Escot.

"Certainly" said Dr. Gaster.

"How do you prove it?" said Mr. Escot.

"It requires no proof" said Dr. Gaster, "it is a point of doctrine. It is written, therefore it is so."

"Nothing can be more logical" said Mr. Jenkison.

"It has been said" continued he "that the ox was made expressly to be eaten by man; it may be said by a parity of reasoning that man was expressly made to be eaten by a tiger; but as wild oxen exist where there are no men, and men where there are no tigers, it would seem that in these instances they do not properly answer the ends of creation."

From Lafleur's Illustrations of Logic.

(*d*) Referring to the Lisbon earthquake of 1755, Voltaire wrote:

"Direz vous en voyant cet amas de victimes;
Dieu s'est vengé, la mort est le prix de leurs crimes?
. . . . . .
Lisbonne est abimée et l'on danse à Paris!"

Against what form of fallacy are the verses directed?

SECOND YEAR.

LOGIC AND PSYCHOLOGY.—(*Advanced Section.*)

INTRODUCTION TO PHILOSOPHY.

WEDNESDAY, APRIL 23RD:—MORNING, 9 TO 12.

Answer 4 questions in A and 4 in B.

A.

1. Indicate the kind of reflection which gives rise to Philosophy. Explain what is meant by Philosophy—distinguishing it from Science.

2. Show how certain general tendencies of early reflection may be illustrated in the beginnings of Greek philosophy (*a*) General; (*b*) Moral.

3. Give some account of the "Socratic Method," illustrating from any of Plato's Socratic dialogues.

4. Illustrate in more than one sphere the effort of Thought to unify.

5. Show the relation of the Syllogism to the principles of (*a*) Classification; (*b*) Sufficient Reason.

6. Briefly explain, with example, what is meant by Inductive Inference.

B.

1. Describe a process of thought which would lead to Idealism.

2. "Does the reality of sensible things consist in being perceived, or is it something distinct from their being perceived, and that bears no relation to the mind?" How is this question answered by Berkeley?

3. How does Berkeley account for the perception of Figure and Extension? Has Modern Psychology added anything to his explanation?

4. Examine Berkeley's treatment (*a*) of the distinction between Primary and Secondary qualities; (*b*) of the notion of Substance, Material and Spiritual.

5. How are the following difficulties dealt with by Philonous:

(*a*) The continued existence of things, when not perceived by the mind.

(*b*) The distinction between real things, and chimæras?

6. Do the arguments of Philonous in the Dialogues, seem convincing to you?

Criticise any of them.

THIRD YEAR.

PSYCHOLOGY.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 12.

(*Answer only eight questions.*)

1. Explain the purport of the criteria, by which the intellectual value of sensations is determined; *or* point out a contrast in the evolution which taste and smell have severally undergone in mental life.

2. Give some account of the principal perceptions of touch, mentioning and explaining any of its illusions.

3. Explain the perception of distance and direction by hearing.

4. Give some account of the experience of persons born blind and afterwards restored to sight; *or* explain the stereoscopic effect (*a*) with double, (*b*) with single, pictures.

5. Explain psychologically the fact that we see the visible world erect, though the retinal image of it is inverted.

6. Explain fully the nature of attention, involuntary as well as voluntary.

7. Discuss the question *either* (*a*) of the *Primum Cognitum, or* (*b*) of Nominalism and Conceptualism.

8. Distinguish the attitudes of Logic and Psychology towards the problems of reasoning, and illustrate the distinction specially by reference to the import of propositions.

9. Define idealisation, and distinguish its different forms, showing how they become united in one; *or* describe the visual arts both in their common characteristic and in their distinctive peculiarities.

10. Describe the principal psychical phenomena of dreaming *or* of hypnotism, and indicate how they may be explained psychologically.

11. The empirical theories of self-consciousness, of the idea of space, of the idea of time. State and discuss *one* of the three.

12. State fully what is meant by the relativity of knowledge, and point out its bearing on theories of existence in general, on Materialism and Agnosticism in particular.

FOURTH YEAR.

MORAL PHILOSOPHY.

THURSDAY, APRIL 3RD:— MORNING, 9 TO 12.

Answer only eight questions.

1. Point out the defects of ancient Stoicism as a theory of the moral life.

2. Sketch Kant's ethical theory.

3. Distinguish (*a*) legal and moral, (*b*) personal and social, (*c*) determinate and indeterminate obligations.

4. Discuss the question, whether the obligation of loyalty is unconditional.

5. Discuss the questions which have been raised in regard to the obligation of truthfulness.

6. Distinguish the logical or rational from the historical or temporal origin of real rights; and explain fully the former.

7. (*a*) What is meant by forfeiture? (*b*) Distinguish sin, wrong, crime. (*c*) What are the two main theories of punishment? (*d*) Wherein may they meet?

8. Describe the change of attitude in regard to the problems of social morality on advancing from the ideas of bare justice to those of benevolence.

9. Discuss the question, whether the reality of the moral law is consistent with pure naturalism; *or* write a note on the so-called arguments for the existence of God.

10. Explain the nature of the different virtues implied in emotional self-control.

11. How would you explain Aristotle's doctrine, that virtue is a mean between two vicious extremes.

12. Describe the discipline for training the will in self-denial as well as in positive virtue.

THIRD YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

THEORY OF KNOWLEDGE WITH PLATO'S THEÆTETUS.

TUESDAY, APRIL 22ND:—MORNING. 9 TO 12.

Answer seven questions of which not less than two should be on the Theaetetus.

1. What is the place in Philosophy of a Theory of Knowledge?

2. Discuss the views in the Theætetus, of the relation

between the doctrines, "Knowledge is Sensation," "Man is the Measure" and "All is Flux."

3. How is the definition "Knowledge is True Opinion" treated in the Theætetus?

4. "Knowledge is not in the appearances of sense, but in our reasoning about them. Show the relation of this thesis to the views of Kant, and of Modern Epistemology.

5. What advance on Plato's Theory of Knowledge do you find in Aristotle?

6. Briefly explain the following:

(*a*) Thought is the ultimate statement of any fact. *Seth.*

(*b*) Thought is relational and discursive.

(*c*) The real has two aspects, existence and character, and thought must always work within this distinction. *Bradley.*

7. Comment on the following:

(*a*) Judgment is analysis and synthesis in one.

(*a*) All Universal judgments are hypothetical.

(*b*) All determination is negation.

8. State and illustrate the general law of Inference.

9. What do you understand by the "Transcendental Proof of the Principles of Experience"?

10. "The Real is the Individual."

Show the application of this

(1) In Aristotle.

(2) In Modern Thought.

11. Is there any criterion of Truth which is proof against the attacks of scepticism?

THIRD YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

GREEK PHILOSOPHY.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

(*Write answers to A and B in separate books. Answer only four questions from each part*).

A.

1. Point out any circumstances in the Ionian colonies, favourable to intellectual culture.

2. Contrast the doctrines of Parmenides and Herakleitos.

3. Compare the doctrines of Empedokles, of Demokritos and of Anaxagoras with regard to the elements of things.

4. Give an estimate of the teaching of the Sophists in its intellectual, its moral and its religious aspects.

5. Give an account *either* of the method of Sokrates, *or* of the doctrines he taught, especially in Ethics.

6. Write a brief note on any three of the following:—Euclid, Aristippos, Hegesias, Antisthenes, Diogenes.

B.

1. Greek Philosophy has been described as a conversation, each successive system furnishing an answer to some question, implied in the last. Apply this view to the philosophies of Plato and Aristotle.

2. What do you consider the central idea of Plato's Republic? Show how it is worked out in the account of the State, and of the Individual.

3. *Either* give some account of the Mythical Element in Plato's philosophy, *or* examine Plato's conception of "The Good."

4. Show the application of Aristotle's Forms of Thought in his system, *especially* in his practical philosophy.

5. What is meant by the "Organic view of the State?" To what extent does it appear in Greek philosophy?

6. Give the most important features of Aristotle's influence on philosophy, contrasting it with that of Plato.

THIRD YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

ENGLISH EMPIRICISM, IDEALISM AND CRITICISM: LOCKE, BERKELEY AND HUME.

(*First Paper.*)

FRIDAY, APRIL 4TH:—MORNING, 9 TO 12.

Answer questions 7, 8, 9, and five others.

1. Describe the intellectual conditions into which Locke was born, and point out how these had some influence on the problems discussed in the Essay.

2. What are the main arguments against innate knowledge? Are they valid against principles *a priori* in the Kantian sense?

3. Write a note on Locke's use of the term *idea*, and compare it with Berkeley's and Hume's use of the same term.

4. Describe the aim and method of the Second Book of the Essay on Human Understanding and compare it with the Fourth Book.

5. Discuss Locke's account of the sources of knowledge.

6. Explain Locke's distinction between the primary and secondary qualities. To what extent is Berkeley's criticism valid?

7. Give an account *either* of Locke's doctrine of Space and Time *or* of his examination of the concept of Substance.

8. Discuss (*a*) Locke's definition of knowledge, (*b*) his classification of the kinds of knowledge.

9. Explain how Sensation is both a positive and negative limit of knowledge.

10. What does Locke say regarding the reality of knowledge? What objections are urged against the arguments of subjective Idealism?

11. "For what a man sees, he cannot but see, and what he perceives, he cannot but know that he perceives." —Essay IV. 13. What meaning and what value can be attached to this dictum?

THIRD YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

LOCKE, BERKELEY AND HUME.

(*Second Paper.*)

SATURDAY, APRIL 5TH:—MORNING, 9 TO 12.

Answer questions 3 *and* 8, *and five others.*

1. State Berkeley's view regarding abstract ideas and make any critical remarks you consider necessary.

2. Is the existence of unconscious "spirits" (during periods of unconsciousness) more intelligible than the existence of "unperceiving" matter? What reply would Berkeley make?

3. Discuss some of the fundamental difficulties involved in Berkeley's psychological Idealism.

4. *Either* show how Siris endeavours to reconcile physical causation and scientific investigation with the constant agency of supernatural Reason and Will; *or* examine the analogical argument of Alciphron.

5. State your opinion as to the nature, extent and value of Hume's Scepticism.

6. Describe carefully (with illustrations) the principal kinds of knowledge according to Hume and compare the divisions with those made by Locke.

7. What are the foundations of Hume's philosophy? What principle is put forward as an ultimate criterion of truth and what is its value?

8. Give a detailed account of Hume's Theory of Causation and point out in what respects, if any, you consider it requires modification.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY

HONOURS.

ARISTOTLE'S NICOMACHEAN ETHICS.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 12.

Answer seven questions.

1. What is Aristotle's attitude towards common opinion? Illustrate by reference to his determination of the End of Life.

2. "We are dealing with matters in which accuracy is impossible." Show how this conception of Ethics influences Aristotle's method.

3. Give some account of the Doctrine of the Mean, showing its relation to Greek modes of thought, and illustrating its application to one or more of the virtues.

4. "The tone of the Book on Justice is legal rather than moral."
Examine the 5th Book in the light of this view.

5. How does Aristotle solve the difficulty that action may be involuntary, since the man cannot choose the end?

6. "If Phronesis (Practical Reason) be present, all the virtues will be present." Fully explain this statement and the conception of Phronesis involved.

7. What is Aristotle's answer to the question. How can one know the right and do the wrong?

8. Compare the two theories of "Pleasure," in the Ethics.

9. Estimate the place of Friendship in Aristotle's system.

10. Show how the Ethics prepares the way for the Politics.

11. In what leading ideas of modern Ethics do you find Aristotle's system lacking

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

JAMES' PRINCIPLES OF PSYCHOLOGY, VOL. II.

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

(*Answer only eight questions.*)

1. "Pure sensation can be realised only in the earliest days of life." Explain.

2. Explain Galton's experiments on different types of imagination.

3. Discuss Bain's theory of the neural process in imagination.

4. State James' theory of the perception of space.

5. Give an analysis of the mental state of belief.

6. Explain the relative importance of association by contiguity and association by similarity.

7. "Every possible feeling produces a movement." Explain and illustrate.

8. How does James explain avarice?

9. Sketch James' theory of emotion. State any of the objections to it, and his reply.

10. What is the indispensable prerequisite of voluntary action; and what, the essential feature of willing?

11. Criticise the theory that pleasure and pain are the sole springs of action.

12. Discuss Spencer's theory of the origin of necessary truths.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

SPENCER'S FIRST PRINCIPLES.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

(*Answer only six questions.*)

1. What are the ultimate religious ideas and the ultimate scientific ideas; and what is their reconcilation?

2. State Spencer's doctrine on the relativity of all knowledge.

3. Explain the definition and the data of philosophy.

4. "Such is the foundation of any possible system of positive knowledge—the sole truth which transcends experience by underlying it." Explain.

5. How does Spencer arrive at the Rhythm of Motion.

6. Distinguish Simple and Compound Evolution.

7. State the Law of Evolution as formulated by Spencer, and explain its terms.

8. Explain Dissolution in relation to Evolution.

9. Make any remarks of your own on Spencer's doctrines.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

GREEN'S PROLEGOMENA TO ETHICS BOOKS II. and III.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

Answer seven questions.

1. How does Green interpret the "Freedom of the Will"?

Show that this principle is the necessary foundation of Ethics.

2. What account does Green give of the "Self"?

3. Show by analysis of some imaginary case, what is the process when one motive amongst many is adopted, and the act follows.

4. Discuss the relation between,
Either Desire and Intellect
or Desire and Will.

5. What is the ground of the distinction between the good and the bad Will?

6. Give some account of Green's criticisms of Utilitarianism and its exponents.

7. Is it possible to consider the "divine principle," as realised in the progress of a nation, or of humanity?

8. Show how the development of the moral ideal involves the extension of the area of common good.

9. What are the most important contributions of Greek thought to the Moral ideal in Green's view. Point out an inevitable limitation in the Greek ideal.

10. Consider the relation of Modern to Greek conceptions of (α) Fortitude (β) Self-denial.

11. In what sense is reason the basis of all social institutions.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

SPINOZA'S ETHICS.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

Answer eight questions.

1. (*a*) What is the aim of Spinoza's system?
(*b*) What is its method?
(*c*) In how far is it applicable to the problem?

2. "Quidquid est in Deo est, et nihil sine Deo esse neque concipi potest." I., 15. Explain the steps by which Spinoza reaches this proposition.

3. Discuss the difficulty involved in Spinoza's doctrine of the indivisibility of substance.

4. What is the attitude of Spinoza to the concepts of (*a*) Development and (*b*) Purpose? Is this attitude consistent?

5. "Ordo et connexio idearum idem est ac ordo et connexio rerum." Explain carefully how Spinoza reaches this proposition and point out its significance.

6. Describe the different kinds of knowledge and explain the practical significance of the third kind.

7. Give a short account of the Third Part of the Ethic.

8. Explain the conditions of Human Bondage.

9. Make a few remarks (explanatory or critical or both) on; *causa sui, attributus, modus, causa libera, causa adequata, esse formale, actio, passio, conatus, sub specie aeternitatis, amor intellectualis Dei, idea Dei.*

10. Compare the conceptions of God as developed in the First and Fifth Parts of the Ethic.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY

HONOURS.

WATSON'S OUTLINE OF PHILOSOPHY.

SATURDAY, APRIL 5TH:—MORNING, 9 TO 12.

Answer question 5, *and six others.*

1. Describe carefully the scope and method of Philosophy at the present time.

2. Discuss the question whether there be any necessary connection between Agnosticism, Scepticism and Dogmatism.

3. Explain, with criticism if desirable, Comte's law of the three stages. Is Watson's criticism of Comte wholly justified?

4. What is the gist of Aristotle's criticism of Phenomenalism? Would it hold against such a Phenomenalism as Kant's?

5. Give a summary of Watson's argument for Speculative Idealism, pointing out how the author finds a basis

for a teleological interpretation of biological phenomena. Express an opinion as to how far the main position has been established.

6. Discuss the opposition between Object and Subject and say whether it necessitates a metaphysical Dualism.

7. What are the fundamental concepts of Ethics, and how are they developed by Watson?

8. Compare Kant's and Green's treatment of the problem of human freedom.

9. Give in outline Watson's view concerning the Philosophy of the Absolute as exemplified in Religion and Art.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY

HONOURS.

THE PHILOSOPHY OF KANT.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

(Answer only six questions.)

1. "How are synthetic judgments *a priori* possible?" Explain the question.

2. Define Aesthetic, Logic, Analytic, Dialectic, and explain what is meant when they are distinguished as transcendental.

3. Give the table of the Categories, and explain how it is reached.

4. Name and state the Principles of the Pure Understanding.

5. What are Ideas, and what is the process by which they are formed?

6. State the Antinomies of Pure Reason, and indicate briefly how each is solved.

7. Give Kant's classification of theistic arguments, and the general drift of his criticism.

8. Give a brief outline of the Analytic of Pure Practical Reason.

9. Wherein consists the Antimony of Pure Practical Reason; and what are the postulates by which it is solved?

10. Explain the Antinomy of the Teleological judgment, and its solution.

FOURTH YEAR.

MENTAL AND MORAL PHILOSOPHY HONOURS.

SCHOPENHAUER: *The Principle of Sufficient Reason and Selections from The World as Will and Idea.*

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

Answer questions 4 and 7, and four others.

1. (*a*) Explain the title: The fourfold root of the Principle of Sufficient Reason.

(*b*) What, according to Schopenhauer, is the relation of the Principle of Ground and Consequence to the Principle of Causation and what is your opinion as to the correctness of the view ?

2. (*a*) Are Matter and Force subject to the Principle of Causation? (*b*) What are the various forms in which the Causality of Nature appears? In answering illustrate.

3. Give the substance of Schopenhauer's criticism of Kant's proof of the Principle of Causation.

4. State and examine carefully Schopenhauer's proof of its *a priori* character.

5. How is it, according to Schopenhauer, that we understand the causality of the will better than any other kind? Do you consider the doctrine well-founded?

6. What is meant by the Objectivation of the Will?

7. Is there any necessary connection between Schopenhauer's Metaphysic of Will and his Idealism? In how far are they mutually compatible?

8. Compare Schopenhauer's Metaphysic of Nature with Occasionalism.

ECONOMICS AND POLITICAL SCIENCE.

THIRD AND FOURTH YEARS.

POLITICAL SCIENCE.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Compare as existing in England, the United States, and France,—

i. The Relations of Church and State.

ii. The Relation of the Courts of Law to the Legislative and Executive Powers.

2. Discuss the legislative power of the Congress of the United States.

3. Describe the composition, powers, etc., of the following bodies:—the Local Government Board, the Conseil d'Etat, Boards of Equalization, the Bundesrath, the Delegations.

4. Accurately explain the political Status of Cuba.

5. Write a short essay (not more than 900 words) on ONE of the following topics,—

i. The Right of the Majority to rule.

ii. The true sphere of Governmental action.

iii. The relation of the State to the Individual.

THIRD AND FOURTH YEARS.

ECONOMIC THEORY.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

(*Number* EIGHT *and five other questions to be answered.*)

1. Define *Wealth, Capital, Income,* showing particularly the relations between the two latter conceptions.

2. Shew how *Exchange Value* is related to *Cost of Production* and to *Utility.* Mention cases in which value is little influenced by cost of production.

3. It used to be believed that increase of population tended to the increase of rent. How would you express the tendency referred to, having regard to modern conditions?

4. In what principal ways is the efficiency of production (*a*) increased (*b*) decreased, by the modern movement towards industrial combination?

5. By what other circumstances besides its *quantity* is the value of Money determined? Examine the connection between the supply of Money and the state of Credit.

6. Enumerate the chief items, in addition to merchandise imports and exports, which go to determine the balance of international financial obligations, and consider the bearing of each on the situation of Great Britain and of the United States respectively.

7. State the causes and limits of variations in the rate of exchange between any two countries. Consider carefully the influence of changes in the discount rate on the rates of exchange.

8. Write a short essay on one of the following subjects:—

(*a*) The eight-hour day.
(*b*) Paper currency.

FOURTH YEAR.

PUBLIC FINANCE.

FRIDAY, APRIL 4TH:—AFTERNOON, 2.30 TO 5.30.

(*Six questions to be answered.*)

1. State the leading features of contrast, between public or state economy and that of the individual or association, which affect the financial administration of each.

2. On what grounds is state interference for the relief of the destitute poor supported? Consider the application of Adam Smith's dictum, relating to the proper objects of state expenditure, to this case.

3. Discuss a classification of state revenues in accordance with the more or less special nature of the benefit or service in respect of which the revenue is derived.

4. What is understood by the "shifting" of taxation? Show how the burden of particular taxes may be shifted and diffused through the action of commercial and industrial competition, distinguishing between the general effects of these two forms of competition.

5. Discuss a suitable standard of "equality" in the incidence of any system of taxation. Examine particularly the case for progressive taxation (*a*) in individual taxes, (*b*) in the general system.

6. What is meant by double taxation? Discuss its practical importance and the chief modes in which it is liable to occur.

7. Compare the policies in the financing of a war represented by (*a*) increased taxation, (*b*) loans, in respect of efficiency and of the industrial effects produced.

8. Discuss principles which should influence the allocation of particular functions and particular sources of revenue to local and central governments respectively.

MATHEMATICS AND NATURAL PHILOSOPHY.

FIRST YEAR.

GEOMETRY.—ARITHMETIC.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

A.

1. If the extremities of a diameter of a circle be joined to any point on the circumference and from this point a perpendicular be let fall on the diameter prove that the square of the perpendicular is equal to the rectangle under the segments of the diameter.

2. Prove that angles at the centre of a circle are in the same ratio as the arcs on which they stand. How is this theorem used to get a numerical expression for the magnitude of an angle?

3. In a given circle inscribe a chord of given length less than the diameter.

(*a*) Prove that the middle points of all such chords lie on a concentric circle.

4. Define simliar segments of circles. Prove that if they stand on equal chords they are equal.

5. A gallon of water weighs ten pounds; a cubic inch weighs 252.5 grs.; find the number of gallons in a tank 6 feet by 3 feet by 2 feet.

6. If the Moon travel round the Earth in 27 1-3 days, find the angle at the centre of the Earth described in 1 hour, 21 minutes, 54 seconds.

B.

7. Bisect a given arc of a circle.

(*a*) If two circles cut one another, the straight lines joining their centres, being produced, bisect all the four arcs into which the circles are divided.

8. Circumscribe a circle about a given rectangle.

9. Similar triangles are to one another in the duplicate ratio of their homologous sides.

10. The rectangle contained by the diagonals of a quadrilateral in a circle is equal to the sum of the rectangles contained by the opposite sides.

11. A meter contains 39.37 inches: Express to three decimal places a mile in meters.

12. A plate of Gold, 3 inches square and $\frac{1}{8}$ of an inch thick is extended by hammering so as to cover a surface of 7 yards square; find its thickness after hammering.

FIRST YEAR.

TRIGONOMETRY AND ALGEBRA.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

A.

1. Define a radian, and a second. Find the ratio of the one to the other.

2. The sine and cosine of an angle are in the ratio of 3: 2, find them to three places of decimals. Can you find an angle whose sine is $\frac{3}{2}$? Explain.

3. Prove that the sum of the cosines of two angles is equal to twice the cosine of half their sum multiplied by the cosine of half their difference.

4. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$, prove

$$\frac{a}{b} = \frac{l\,a + m\,c + n\,e}{l\,b + m\,d + n\,f}$$

5. A number expressed by two digits is equal to three times the sum of the digits; find the number.

6. If $a + \sqrt{b} = x + \sqrt{y}$, when a and x rational, and $\sqrt{b}$ and $\sqrt{y}$ are irrational, prove $a = x$, and $b = y$.

B.

7. Prove

(a) $\sin A + \sin B = 2 \sin \frac{(A + B)}{2} \cos \frac{(A - B)}{2}$

(b) $\sin (A + B) = 2 \sin \frac{(A + B)}{2} \cos \frac{(A + B)}{2}$

(*c*) $\cos(60^\circ + A) + \cos(60^\circ - A) = \cos A$.

8. Prove that in any triangle

(1) $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

(2) $\tan \dfrac{(A-B)}{2} = \dfrac{a-b}{a+b} \tan \dfrac{(A+B)}{2}$

(3) $\dfrac{a+b}{c} = \dfrac{\cos \frac{(A-B)}{2}}{\cos \frac{(A+B)}{2}}$

9. From two stations A and B on the shore 3742 yds apart, a ship AC is observed at sea. The angles CAB. and ABC are simultaneously observed to be $72^\circ\ 34'$ and $81^\circ\ 41'$ respectively. Find the distance from A to the ship.

10. Two straight railways intersect at an angle of 60°. From their point of intersection two trains start and run for one hour, one of them at the rate of 40 miles an hour. Find the rate of the second train, if at the end of the hour the trains are 35 miles apart.

11. Solve the following equations:—

(*a*) $\dfrac{2x+5}{5x+3} = \dfrac{2x+1}{5x+2}$

(*b*) $\dfrac{x}{a} + \dfrac{y}{b} = 2, \quad \dfrac{x}{c} = \dfrac{y}{d}$

(*c*) $\dfrac{x+4}{x-4} + \dfrac{x-2}{x-3} = 6\frac{1}{3}$

(*d*) $x^2 + y^2 = 185, \ x - y = 3$

(*e*) $\sqrt{x+25} = 1 + \sqrt{x}$

12. Simplify

(1) $\left(x + y - \dfrac{1}{x + y - \frac{xy}{x+y}}\right) \times \dfrac{x^3 - 7^3}{x^2 - y^2}$

(2) $\dfrac{2(7x-4)}{6x^2 - 7x + 2} + \dfrac{x - 10}{6x^2 - x - 2} - \dfrac{2(4x-1)}{4x^2 - 1}$

SECOND YEAR.

SPHERICAL TRIGONOMETRY.—ALGEBRA.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

A.

1. In a spherical triangle prove

$$\tan \tfrac{1}{2}(A + B) = \frac{\cos \tfrac{1}{2}(a - b)}{\cos \tfrac{1}{2}(a + b)} \cot \tfrac{1}{2} C.$$

State the case in the solution of which this formula is employed. Write down the other formulae necessary for the complete determination of all the parts of the triangle.

2. Prove that an equilateral spherical triangle is also equiangular.

3. Show that the values of x and y which satisfy the equations

$$a_1 x + b_1 z + c_1 = o$$
$$a_2 x + b_2 z + c_2 = o$$

are given by

$$\frac{x}{\begin{vmatrix} b_1 & c_1 \\ b_2 & c_2 \end{vmatrix}} = \frac{z}{\begin{vmatrix} c_1 & a_1 \\ c_2 & a_2 \end{vmatrix}} = \frac{1}{\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}}$$

4. Show that

$$\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = \begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix}$$

5. If the Napierian logarithms of N and 10 are denoted by $\log_e N$ and $\log_e 10$ respectively prove that the log. of N to be base 10 is found from

$$\log_{10} N = \frac{1}{\log_e 10} \cdot \log_e N$$

(*a*) How would you calculate Napierian logarithm from the Tables of common logarithms.

6. Find the present value of an annuity of $100 for n years allowing compound interest at r per cent.

B.

7. Prove that any two sides of a spherical triangle are together greater than the third side.

8. In a spherical triangle—

(*a*) $\cos A = \dfrac{\cos a - \cos b \cos c}{\sin b \sin c}$

(*b*) $\sin \dfrac{A}{2} = \sqrt{\dfrac{\sin (s-b) \sin (s-c)}{\sin b \sin c}}$

(*c*) $\sin \dfrac{A+B}{2} \cos \dfrac{c}{2} = \cos \dfrac{a-b}{2} \cos \dfrac{C}{2}$.

9. In a right angle triangle
given $A = 64° 15'$, $B_0 = 48° 20'$, find a, b, c.

10. The fifth term of a geometrical progressor is 81 and the second term is 24; find the series.

11. (*a*) Find the middle term of the expansion

$$\left(\frac{x}{a} + \frac{a}{x}\right)^{10}$$

(*b*) Find the fifth term of the expansion $(3a-2b)^{-1}$.

12. Transform 23861 from scale nine to scale eight.

SECOND YEAR.

SOLID GEOMETRY. CONIC SECTIONS. DYNAMICS.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

A.

1. Through a given point one plane, and only one, can be drawn parallel to two given lines.

2. Every plane containing the perpendicular to a given plane is perpendicular to that plane.

3. If A and A^1 are the vertices of a central conic, F, F^1 the foci, X and X^1 the feet of the directrices, C the middle point of FF^1, then

$$AF : AX :: CF : CA :: CA : CX.$$

4. In a parabola the parameter of the diameter through $P = 4\,FP$, F being the focus.

B.

5. If a straight line be perpendicular to each of two intersecting straight lines at their point of intersection, it will be perpendicular to the plane which contains them.

6. The angle which a straight line makes with its projection on a plane is less than that which it makes with any other straight line that meets it in that plane.

7. In a parabola the tangent at any point P bisects the angle between the focal distance of P and the perpendicular from P on the directrix; and if the tangent meets the directrix in Z, PZ subtends a right angle at the focus.

8. In a parabola a diameter bisects all chords parallel to the tangent at its extremity.

C.

9. Describe Morin's Machine for verifying the laws of projectiles.

A gun can project a shot with a speed of 2,000 feet per second. Form an equation to find the angle at which the gun must be fired so as to strike a fort 800 feet above it at a horizontal distance of two miles.

10. A ball weighing 20 lbs., travelling 12 feet per second, *meets* another weighing 8 lbs., and travelling 16 feet per second. If the first ball be just brought to rest, what is the coefficient of elasticity?

Indicate briefly how the equations you employ are obtained.

11. Describe the method of determining the value of gravity by Kater's pendulum, and point out wherein it is superior to the use of a simple pendulum.

Explain by a numerical example how you apply the method of coincidences.

12. A heavy object is suspended by a wire, and when the wire is twisted, the time of swing is found to be 5.42 seconds. A ring of brass, weighing 50 gms, and having a radius of 10 cms, is then attached to it so that the wire passes through the centre of the ring and is perpendicular to its plane. The time of swing is now found to be 8.34 seconds. Find the moment of inertia of the heavy object about the wire as axis.

THIRD AND FOURTH YEARS.

MECHANICS.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. State the principle of the Lever. When was it first clearly stated, and what do you consider to be the reasons for its acceptance?

An iron bar weighs 4 lbs. per foot length. It balances about a point 2 ft. from one end when a weight of 5 lbs. is suspended from that end. How long is the bar?

2. Prove the formula $s = \frac{gt^2}{2}$ for a falling body.

A ball thrown up is caught by the thrower 7 seconds afterwards. How high did it go, and with what speed was it thrown? How far below its highest point was it 4 seconds after the start?

3. State Newton's Second Law of Motion, and starting from it shew what should be the unit of force, on the British system, in order that we may express it by the formula: — $MV = Pt$.

A 7 lb. weight hanging over the edge of a smooth table drags a mass of 49 lbs. along it; find the acceleration and the distance moved through in 5 seconds from the start.

4. Distinguish between the *momentum* and the *energy* of a moving body.

A train of 80 tons is moving at 30 miles an hour. What force can stop it (*a*) in 400 yards, (*b*) in 30 seconds?

5. Shew how to find the resultant of any number of forces acting at a point.

Forces of 2, 4, 6 and 8 lbs. weight respectively, act at a point in directions due East, North East, North, and North West. Find the magnitude and direction of their resultant.

6. Find the ratio of the Power to the Weight in the Inclined Plane, when the Power acts parallel to the plane.

Find the horizontal force required to support a weight of 60 lbs. on a smooth inclined plane which has a gradient of 5 in 13.

7. Define the centre of gravity of a body, and find that of a plane triangle.

8. The wheels of a coach are 5 feet apart, and the centre of gravity is 10 feet from the line of contact of the wheels and ground on either side. To what height may the wheels on one side run up a bank before the coach is upset?

9. Explain how the pressure of the atmosphere is measured by the barometer. Find the pressure on the lid of a box measuring 2 ft. by 3 ft. on a day when the barometer stands at 29.4 inches, having given that the specific gravity of mercury is 13.6 and a cubic foot of water weighs 1,000 ounces.

10. State Archimedes' principle of floating bodies and prove it.

Explain how Nicholson's Hydrometer may be used to determine the specific gravity of a small piece of copper.

11. Describe an experiment to verify Boyle's law.

500 cub. ins. of air at 30 inches pressure and temperature 12° C are brought to 85° C and 16 inches pressure. What is the new volume?

12. A cylindrical diving bell 9 feet high is immersed in water so that its top is 27 feet below the surface. Find how high the water rises within it, the water barometer standing at 34 feet.

THIRD YEAR.

ASTRONOMY.—OPTICS.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

A.

1. Define Declination, Right Ascension, Latitude and Longitude on the Celestial Globe: Altitude, Azimuth, Zenith Distance, North Polar Distance; Latitude and Longitude on the Terrestrial Globe. Parallels of Latitude.

(*a*) What is the maximum declination of the Sun? If its declination and longitude changed uniformly what would each of them be on the 21st of every month of the year, beginning with the 21st of March?

2. Explain the manner in which the seasons at Montreal depend on the latitude of Montreal, and the inclination of the Ecliptic of the Equator.

(*a*) If the Equator coincided with the Ecliptic, state what you think would be the effect on the climate here.

3. Explain the method of finding the distance of the Earth from the Moon.

4. State that one of Kepler's Laws which connects the distance of a planet from the Sun with the time of its revolution in its orbit.

Apply it to find roughly the distance of Jupiter, assuming it to travel round the Sun in twelve years.

5. What is the effect of refraction on the altitude of a Star. Explain this, and prove that within certain limits, refraction varies as the tangent of the zenith distance of the Star.

6. Prove that the Altitude of the pole at any place is equal to the Latitude of the place.

B.

(OPTICS.)

7. Describe and explain the principle of the Sextant, proving the proposition on which it depends.

8. Define the Principal Focus of a concave mirror, and give a geometrical construction for finding the image of an object placed in front of it.

How must a search light be placed with regard to the reflector so as to throw a parallel beam?

9. State the laws of Refraction.

Explain the terms;—*total reflection*, *critical angle*. What must be the index of refraction in order that the critical angle may be 60°?

The index of refraction for Canada balsam is 1.540, and for diamond 2.755. Find the index for a ray going from diamond into Canada balsam.

10. Draw diagrams shewing the position of an arrow with regard to the focus of a convex lens so as to form:

(*a*) a magnified real image,
(*b*) a magnified virtual image,
(*c*) a real image of the same size as the object.

Draw the rays in case (*b*) by which an eye behind the lens sees the top of the arrow.

11. Describe the Astronomical Telescope.

The object lens of a telescope has a focal length of 3

feet, and the eye-lens $\frac{1}{4}$ of an inch. It is pointed at a man 6 feet high, two miles away.

Find the size of the image formed in the focus of the object lens. How close must the eye-lens be to this image in order to magnify it 200 times?

12. What is meant by an achromatic lens? Explain the need of making them and how they are constructed.

FIRST YEAR.

MATHEMATICS.—(*Advanced Section.*)

GEOMETRY, I.

MONDAY, APRIL 21ST:—MORNING, 9 TO 12.

A.

1. Through a given point, draw a line which shall form with two given lines a triangle of minimum area.

2. Given the bases of two triangles in magnitude and position, find the locus of a common vertex such that the sum of the areas shall be given.

3. The sum of the perpendiculars from any point in the base of an isosceles triangle on the equal sides is equal to the perpendicular from one of the base angles on the opposite side.

4. Divide a given line AB in C, so that the rectangle under BC and a given line may be equal to the square of AC.

5. Draw a common tangent to two circles.

6. Find the locus of a point such that perpendiculars let fall from it on the sides of a given triangle are collinear.

B.

7. The three perpendiculars to the sides of a triangle at their middle point are concurrent.

8. If the base AB of a triangle be divided in D so that

$m\ AD = n\ DB$; then

$m\ AC^2 + n\ BC^2 = m\ AD^2 + n\ BD^2 + (m + n)\ CD^2$.

9. The rectangle contained by the perpendiculars from any point O in the circumference of a circle on two tan-

gents AC, BC, is equal to the square of the perpendicular from the same point on their chord of contact AB.

10. Describe a circle having its centre at a given point, and cutting a given circle orthogonally.

11. Inscribe an equilateral triangle in a given square.

12. In any triangle the rectangle contained by two sides is equal to the rectangle contained by the perpendicular on the third side and the diameter of the circumscribing circle.

FIRST YEAR.

MATHEMATICS.—(*Advanced Section.*)

GEOMETRY, II.

MONDAY, APRIL 21ST:—AFTERNOON, 2.30 TO 5.30.

A.

1. If from a point A, a perpendicular be drawn to the polar of another point B, and from B a perpendicular to the polar of A, then, if C be the centre of the circle, the rectangle $CA, BQ = CB, AP$.

2. Reciprocate the following theorem:—"The lines joining the vertices of any triangle to the points of contact of its inscribed circle are concurrent.

3. If a quadrilateral be inscribed in a circle and then completed, prove that the intersection of the diagonals is the pole of the third diagonal.

4. If two triangles $A\,B\,C$, $A^1\,B^1\,C^1$ be such that the lines AA^1, BB^1, CC^1 are concurrent, then the intersections of the corresponding sides are collinear.

5. The six centres of similitude of three circles lie three by three on four lines.

6. Find the radical axes of two given circles.

B.

7. If four collinear points form a harmonic system, their four polars with respect to any circle form a harmonic pencil.

8. The inverse of a circle is either a line or a circle according as the centre of inversion is on the circumference of the circle or not on the circumference.

9. If two pencils have a common ray and the same anharmonic ratio, the intersections of the remaining pairs of rays are collinear.

10. If A and B be two points, such that the polar of A passes through B, then the polar of B, passes through A.

11. Given the vertical angle of a triangle, and the segments into which the line besecting it divides the base. Construct the triangle.

2. If a triangle given in species have one angular point fixed, and if a second angular point moves along a given line, the third will also move along a given line.

FIRST YEAR.

MATHEMATICS.—(*Advanced Section.*)

ALGEBRA—THEORY OF EQUATIONS.

MONDAY, APRIL 21ST:—MORNING, 9 TO 12.

A.

1. Find the number and situation of the real roots of the equation

$$x^3 - 7x + 7 = 0$$

2. Any value of x which renders $f(x)$ a maximum or a minimum is a root of the derived equation

$$f^1(x) = 0.$$

(*a*) Find a maximum or minimum value of

$$2x^2 + x - 6.$$

3. Every equation of an odd degree has at least one real root of a sign opposite to that of its last term.

4. Imaginary roots enter in pairs.

5. Find $\sqrt{1 - x}$ by the method of indeterminate coefficient.

6. Expand $(1 - x)^{-\frac{1}{2}}$ by the Binomial Theorem.

B.

7. Transform the equation $x^3 - 6x^2 + 4x - 7 = 0$ into one which shall want the second term.

8. Solve the equation $x^5 + x^4 + x^3 + x^2 + x + 1 = 0$.

9. If in any equation each of the negative coefficients be taken positively, and divided by the sum of all the positive coefficients which precede it, the greatest quotient thus formed increased by unity is a superior limit of the positive roots.

10. The roots of the equation

$$x^3 - 9x^2 + 23x - 15 = o,$$ are in

arithmetical progression; find them.

11. The fifth term of a Geometrical progression is 81, and the second term is 24; find the series.

12. Find the amount of an annuity left unpaid for a given number of years, allowing compound interest.

SECOND YEAR.

MATHEMATICS.—(*Advanced Section.*)

TRIGONOMETRY (*Plane and Spherical*) SOLID GEOMETRY.

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

A.

1. Prove that

$$\log_e (1 + y) = y - \tfrac{1}{2}y^2 + \tfrac{1}{3}y^3 - \text{etc.}$$

2. Define cosh x and sin h x, and prove that

$$\cosh 2x = 1 + 2 \sin h^2 x.$$

3. State and prove Demoivre's Theorem for a positive integer.

4. State Napier's rules for the solution of right angled spherical triangles.

5. In a spherical triangle given $a = 46^\circ\ 24'$; $b = 67^\circ\ 14'$; $c = 81^\circ\ 19'$ find the angle A.

6. If two triangles on a sphere have two sides of the one respectively equal to two sides of the other and the included angles equal, the triangles are equal in every respect.

B.

7. Prove

$$\tan n\theta = \frac{n\tan\theta - \frac{n(n-1)(n-2)}{\lfloor 3}\tan^3\theta \text{ etc.}}{1 - \frac{n(n-1)}{\lfloor 2}\tan^2\theta + \frac{n(n-1)(n-2)n-3)}{\lfloor 4}\tan^4\theta + \text{etc.}}$$

8. Prove $\cos\theta = 1 - \frac{\theta^2}{\lfloor 2} + \frac{\theta^4}{\lfloor 4} - \frac{\theta^6}{\lfloor 6} + \sim$,

and $\sin\theta = \theta - \frac{\theta^3}{\lfloor 3} + \frac{\theta^5}{\lfloor 5} - \text{etc.}$

9. Find the sum of n terms of the sum $\sec\theta \sec 2\theta + \sec 2\theta \cdot \sec 3\theta + \sec 3\theta \sec 4 + \text{etc.}$

10. In a spherical triangle prove that

$$\cos\frac{A+\beta}{2}\cos\frac{c}{2} = \cos\frac{a+b}{2}\sin\frac{C}{2}$$

11. If from a fixed point P on the surface of a sphere an arc of a great circle be drawn, meeting a small circle at A and B, and if PA and BP be denoted by ρ and ρ_1, then $\tan\frac{1}{2}\rho \tan\frac{1}{2}\rho^1$ is constant.

12. In any trihedral angle the sum of any two of its faces is greater than the third.

SECOND YEAR.

MATHEMATICS.—(*Advanced Section.*)

DIFFERENTIAL AND INTEGRAL CALCULUS.

TUESDAY, APRIL 22ND:—AFTERNOON, 2.30 TO 5.30.

1. If $y = f_1(x)$, define $\frac{dy}{dx}$, and prove that $\left(\frac{dy}{dx}\right)^1$ is the tangent of the angle made with the axis of x by the tangent to the curve at the point $x^1\ y^1$.

(*a*) Hence find the equations of the tangent and normal at the point x^1, y^1, and the lengths of the subtangent and subnormal.

2. When one side of a right-angled triangle is re-

garded as an infinitely small quantity of the first order, erence between the hypotenuse and the remaining side, is an infinitely small quantity of the second order.

3. Prove

$$\frac{d^n(uv)}{dx^n} = u\frac{d^n v}{dx^n} + n\frac{du}{dx}\cdot\frac{d^{n-1}v}{dx^{n-1}} + \text{etc} + v\frac{d^n u}{dx}$$

4. Given $y = \sin(1 + x^2)$; $y = \sin(\sin x)$; $y = \log_a x$ find $\frac{dy}{dx}$ for each.

5. Differentiate

$$y = \tan^{-1}\frac{\sqrt{x} + \sqrt{a}}{1 - \sqrt{ax}} : y = \log\frac{1 + x}{1 - x} : y = (a + bx^3)^4$$

6. State and prove MacLaurin's theorem.

(*a*) Expand e^x by it.

7. Find the value of x which makes

$$\frac{\sin x \cdot \cos x}{\cos^2(60° - x)}$$

a maximum.

8. Find the area of a part of a parabola included by the curve (origin at vertex) the axis, and any ordinate. Prove the formula you employ.

9. In finding

$$\int \sin^m\theta \cos^n\theta \, d\theta$$

there are two cases in which formulae of reduction are not necessary. State them and taking numerical examples, find the integrals.

10. Find a formula of reduction for the integral in question 9, taking the most general case.

11. Find the integrals

$$\int \frac{x\,dx}{(1+x)(1+x^2)} : \int \frac{(x-1)\,dx}{(x-3)(x+2)} : \int \frac{1-x}{1+x}\,dx.$$

12. Find the value of the definite integral

$$\int_0^{\frac{\pi}{2}} \sin\theta \, d\theta$$

13. Integrate

$$\int \frac{dx}{1 + x + x^2} : \int \frac{dx}{\sqrt{(x^2 + a^2)}} : \int \frac{dx}{a^2 - x^2}.$$

SECOND YEAR.

MATHEMATICS.—(*Advanced Section.*)

ANALYTIC AND PURE GEOMETRY.

(*Fisrt Paper.*)

FRIDAY, APRIL 18TH:—MORNING, 9 TO 1.

1. Prove that

$$ax^2 + ay^2 + 2gx + 2fy = o$$

represents a circle.

(*a*) Find where $y = mx$ cuts it, and show that if $m = -\frac{g}{f}$, the line will be a tangent. At what point?

2. Find the locus of a point O, being granted that the line joining it to a fixed point makes the same intercept on the axis of x as is made on the axis of y by a perpendicular through O to the joining line.

3. Find the locus of the middle points of the chords of the circle $x^2 + y^2 - r^2 = o$ parallel to $y = mx$.

4. Given the base of a triangle, and that

$$(\tan C = m \tan B),$$

C being the vertical angle, find the locus of the vertex. vertex.

5. Given three points $x'y'$, $x''z''$, $x'''y'''$, find

(*a*) Equations of the sides of the triangle thus formed.

(*b*) Co-ordinates of middle points of the sides.

(*c*) Equations of perpendiculars at the middle points to the sides.

(*d*) Point of intersection of the perpendiculars.

(*e*) Radius of the circle circumscribed to the triangle.

6. Find the equation of the right line bisecting the angle between the two lines

$$a_1 x + b_1 y + c_1 = o \text{ and } a_2 x + b_2 y + c_2 = o.$$

7. Given a point O and a straight line, if on OP, the radius vector to the right line from the point O, a part OQ, be taken inversely as OP, find the locus of Q. (Use polar co-ordinates).

8. PP^1 and QQ^1 are any two parallels to the sides of a parallelogram; find the locus of the intersection of the lines PQ and P^1Q^1.

9. Prove geometrically that if a line be perpendicular to two lines in a plane it is perpendicular to every line in the plane.

10. A solid angle is formed by the intersection of three planes, prove that any two of the plane angles at the point of meeting of the planes are greater than the third.

11. Prove geometrically the property of the parabola which is represented by the equation $y^2 = 4mx$.

12. Prove geometrically that the subnormal in the parabola is constant.

SECOND YEAR.

MATHEMATICS.—(*Advanced Section.*)

ANALYTIC GEOMETRY.—(*Second Paper.*)

MONDAY, APRIL 21ST:—MORNING, 9 TO 12.

1. Prove that the line $a_1(x - x^1) + b_1(y - y^1) = 0$ will be a tangent to the conic

$$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$$

at the point $x^1 z^1$ (assumed to be on the conic) provided $b_1(ax^1 + hy^1 + g) = a_1(hx^1 + by^1 + f)$

(*a*) Give the geometrical interpretation of this condition. Find similarly the condition that the same line should be a tangent at the same point to the circle

$$(x - \alpha)^2 + (y - \beta)^2 = r^2$$

and interpret it.

2. Through any given point $x^1 y^1$, a chord of the conic in the above question is drawn, find the rectangle under its segments.

3. Find the centre of the above conic.

4. Show by transformation of co-ordinates that the curve

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

has an infinite number of pairs of oblique axes (con-

jugate diameters) which will give its equation in the same form. Show that the two of any pair lie on different sides of the axis minor.

(*a*) Show that the tangent at the extremity of any diameter is parallel to the conjugate diameter; and hence find the co-ordinates of the extremity of the diameter conjugate to that passing through $x^1\ z^1$.

5. Prove that the sum of the square of any pair of conjugate diameters is constant.

6. Prove that the length of the perpendicular from the focus of a parabola $y^2 = 4\ mx$, is $\sqrt{m\ (x^1 + m)}$, and interpret this geometrically.

7. Find the pole of the line

$$a_1\ x + b_1\ y + c_1 = o$$

with regard to

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - 1$$

Hence show that the locus of the poles of the line with regard to a system of conics confocal and concentric with this given conic is a right line perpendicular to the given line.

8. Define the *eccentric angle* and explain its use. Derive from it a simple construction for the diameter conjugate to a given diameter.

9. Given the base and sum of sides of a triangle, find the locus of the vertex.

10. Interpret the following equations

$$x^2 - 5\ x\ y + 6\ y^2 = o$$
$$6\ x + 7\ y - 8 = o$$
$$x^2 - 5\ x\ y + 6\ y^2 + 6\ x + 7\ y - 8 = o$$

and state the geometrical relations of the lines they represent.

11. Using trilinear co-ordinates prove that the perpendiculars of a triangle are concurrent.

12. Using trilinear co-ordinates, prove that if there be two triangles such that the perpendiculars from the vertices of the one on the sides of the other are concurrent, then the perpendiculars from the vertices of the second on the sides of the first are concurrent.

THIRD YEAR.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

DYNAMICS.

FRIDAY, APRIL 4TH:—MORNING, 9 TO 12.

1. Find an expression for the acceleration of a particle along the radius vector.

How do you explain the presence of the second term in the expression?

2. A ball is projected with velocity u at an angle a with the horizon, from the foot of a plane inclined i to the horizon. Find the range on the plane; and the condition that the ball should strike it at right angles.

3. A point moves from rest towards a fixed point 10 metres distant, its acceleration being everywhere 4 times its distance from the fixed point. At what distance will it have a velocity of 12 metres per second?

4. Shew that the time of descent down all chords of a vertical circle, terminating in the highest or lowest points, is the same.

Find the line of *slowest* descent from a given point, P, to a vertical circle, in the same plane, whose highest point is at a lower level than P.

5. Find the horizontal force which must be exerted on an engine of 20 tons, which is to go round a curve of 600 yards radius at 30 miles an hour.

6. Two particles of equal mass move one after the other in the same straight line, and the velocity of the hindermost is double that of the other. Shew that after impact their velocities will be as $3 - e$; $3 + e$, e being the coefficient of elasticity.

Justify the equations you employ.

7. Prove the equation for a central orbit

$$\frac{d^2 u}{d\theta^2} + u = \frac{P}{h^2 u^2}$$

If $P = 2\mu \frac{u^5}{c^2} + \mu u^3$, and a particle be projected at an angle of 45° with the initial distance $R = \frac{1}{c}$ with a

velocity which is to the velocity in a circle at the same distance as $\sqrt{2}$ to $\sqrt{3}$, show that the orbit will be

$$r = R(1 - \theta).$$

8. Explain d'Alembert's Principle and shew how to obtain from it the equations of motion of a rigid body.

9. Define the Moment of Inertia of a body about an axis. State, without proof, rules for expressing (1) the moment of Inertia about any oblique axis through the centre of gravity in terms of the Principal Moments at the C. G.; (2) the moment about any axis in terms of the moment about a parallel axis through the C. G.

10. Calculate the moment of inertia of a sphere about a diameter.

11. A sphere of mass 20 lbs. and radius 6 inches is suspended by a horizontal hinge which is a tangent to it. Find the time of an oscillation.

THIRD YEAR.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

OPTICS.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Explain a method for calculating the illumination at any point due to a uniformly bright surface.

Shew that the illumination at any point of a plane which touches a uniformly bright sphere varies inversely as the cube of the distance from the centre of the sphere.

2. A pencil of rays is incident directly on a spherical reflecting surface. Shew that a ray distant y from the axis of the mirror cuts the axis after reflection at a point determined by

$$\frac{1}{v^1} + \frac{1}{u} = \frac{2}{r} + \left(\frac{1}{r} - \frac{1}{u}\right)^2 \frac{y^2}{r}$$

3. Prove the formula for refraction through a thin lens of index μ, and radii, r, s.

The focal length of a double convex lens is 30.6 cm, and the radii of its surfaces 30.4 cm, and 34.5 cm.

What is the refractive index of the glass?

4. A convex lens forms an image of a candle on a screen whose distance from the candle is l. The lens is displaced through a distance d, when a distinct image is again formed. Shew that the focal length of the lens is $\frac{l^2 - d^2}{4l}$

5. Prove that for minimum deviation a ray must pass through a prism symmetrically.

What must be the refracting angle of a prism, for which the index is $\sqrt{2}$ so that rays which are incident on one of the faces at angles greater than 45° cannot emerge from the other face?

6. A small air-bubble in a sphere of glass 4 inches in diameter appears, when looked at so that the bubble and the centre of the sphere are in a line with the eye, to be 1 inch from the surface. What is its true distance? ($\mu = 1.5$).

7. Find the focal length of a lens *equivalent* to a combination of two lenses (focal lengths f_1, f_2) on the same axis at a distance a from each other.

8. Describe the Ramsden and the Huyghens Eye pieces. Why is the former employed in observing telescopes?

9. Explain why it is possible to form *achromatic* object glasses.

10. Find an expression for the breadth of the field of view by *whole pencils* in the Astronomical Telescope.

11. Obtain the differential equation to a ray travelling in a medium whose density varies as the distance from a fixed plane.

The index of refraction is $\mu = \epsilon^{cx}$, where x is the distance from the bounding plane. Find the path of a ray incident on this plane at an angle α

THIRD YEAR.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

STATICS.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 12.

1. Find the resultant of any number of forces acting at a point, and deduce the conditions of equilibrium.

2. A uniform straight rod, moveable about its lower extremity, leans against a vertical wall, and makes an angle of 45° with the horizon. Shew that the force exerted by the wall on the rod is equal to half the weight of the rod.

3. Two smooth spheres of equal radius r and weight, w are placed inside a uniform thin hollow cylinder (radius r^1 less than $2r$) which is open at both ends and rests with one end on a horizontal table. Shew that the weight of the cylinder, that it may not be upset, must be

$$2w.\frac{r^1 - r}{r^1}.$$

4. What is meant by the *centre* of parallel forces?

Find the centre of gravity of a plane triangle.

5. Find the centres of gravity of
(1) a sector of a circle
(2) the area enclosed by the curve $r = a(1 + \cos\theta)$.

6. State the laws of Statical Friction. One end A of a beam AB (length $= l$, distance of C. G. from $B = n$ times its distance from A) rests against a rough vertical wall (angle of repose $= \epsilon$) and a cord tied to the other extremity B is fastened to a point in the wall above A. Shew that if the rod is to rest horizontal, the length of the cord must be

$$\frac{l}{n}\sqrt{n^2 + \tan^2\epsilon}$$

7. Find the equation to the curve in which a heavy string hangs between two points.

8. A string is stretched round a rough curved surface. Find an equation for the tension, neglecting the weight of the string.

A rope makes 3 complete turns round a post (coefficient of friction = .8) and is pulled with a force of 50 lbs. What force must be exerted at the other end to make it slip?

THIRD YEAR.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

SURFACES.—(*First Paper.*)

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. Find the co-ordinates of the *umbilics* on an ellipsoid.

2. Considering the rectilinear generators of an hyperboloid of one sheet, prove that any line of one system meets every line of the other.

3. Find the surface of revolution generated by a right line turning round a fixed axis which it does not intersect.

4. Through a given radius of a central quadric we can in general draw one section of which the given radius shall be an axis.

5. The parallelepiped whose edges are three conjugate semi-diameters of an ellipsoid has a constant volume.

6. If the equation of a quadric be transformed from one set of rectangular axes to another at the same origin, find the functions of the coefficients which remain unchanged.

7. Find the condition that the plane

$$a_1 x + b_1 y + c_1 z + z_1 = o$$

should touch the hyperboloid

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$

8. Show that the equation of the tangent cone from the point $x^1\ y^1\ z^1$ to the ellipsoid

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

is

$$\left(\frac{x^{1^2}}{a^2}+\frac{y^{1^2}}{b^2}+\frac{z^{1^2}}{c^2}-1\right)\left(\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}-1\right)=\left(\frac{x^1x}{a^2}+\frac{y^1y}{b^2}+\frac{z^1z}{c^2}-1\right)$$

9. Find the equation of a plane through

$$\frac{x-x^1}{a_1}=\frac{y-y^1}{b_1}=\frac{z-z^1}{c_1}$$

which is parallel to

$$\frac{x-x''}{a_2}=\frac{y-y''}{b_2}=\frac{z-z''}{c_2}$$

and similarly the equation of the plane through the second line parallel to the first.

10. Find the perpendicular distance between the two planes in the last question.

11. Find the equation of the plane drawn through a given line perpendicular to a given plane.

12. Find the condition that the two given lines in question 9 should intersect.

THIRD YEAR.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

SURFACES. (*Second Paper.*)

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. Prove that at any point on a surface there are two directions at right angles to each other, such that the normal at a consecutive point taken on either, intersects the original normal.

2. If two surfaces cut at right angles and if their intersection is a line of curvature on one, it is a line of curvature on the other.

3. Investigate a method for determining the principal radii of curvature at any point of any given surface.

4. Prove that through a given point three quadrics can be drawn confocal to a given one.

5. Find the locus of the pole of a given plane with regard to a system of confocal surfaces.

6. Find the general differential equation of cylindrical surfaces.

(*a*) Give its geometrical interpretation.

7. Find the equation of the surface generated by a straight line always parallel to the plane $z = 0$, and meeting the circle $x = a$, $y^2 + z^2 = r^2$.

8. Show that the equation of a surface of revolution round the axis of z may be put in the form

$$z = f\ (x^2 + y^2).\ z = f\ (x^2 + y^2)$$

9. All the tangent lines at any point on a surface may be distributed into pairs such that the tangent plane at a consecutive point on either will pass through the other.

FIRST YEAR.

PHYSICS.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. A train of 80 tons is drawn by an engine with a force of 1,000 lbs. weight. In what time will it get up a speed of 45 miles an hour, and how far will it then have travelled?

2. 480 cubic centimetres of gas at a pressure of 746mm. and temperature 18° C. are to be reduced to standard pressure, 760mm. and temperature, 0° C. What will be the new volume?

3. Explain how to find the velocity of sound by means of a resonance tube and tuning fork. Prove the formula you employ.

4. Describe carefully the construction and graduation of a mercury thermometer.

What temperature centigrade is equal to 133° Fahr.?

5. Point out briefly the principles in the theory of heat which are illustrated by (1) ocean currents, (2) the moderating influence of large masses of water upon climate, (3) the formation of Dew.

6. Describe and explain the principle of the Sextant.

7. Given a convex lens of 10 inches focal length. A candle flame 1 inch high is placed (1) 9 inches, (2) 11 inches in front of it. Where and how big will be the images formed? Can they both be received on a screen, and if not, how can you see them?

8. Describe the general appearance of the solar spectrum. How does it help us to draw conclusions as to the constitution of the sun's atmosphere?

9. Mention the essentials of a good lightning rod, giving reasons.

10. Describe either a Daniell's or a Leclanché cell.

The instruments on a telegraph circuit have a resistance of 230 ohms, and the line itself offers a resistance of 13 ohms per mile. How many Daniell cells, each of E. M. F. = 1.06 volts and internal resistance = 4 ohms, will be required to send a current of 10 milli-amperes through 100 miles of such a line?

11. Describe the principal parts of an electric motor, and the purpose of each.

12. Describe and explain the action of an induction coil.

THIRD YEAR.

EXPERIMENTAL PHYSICS, SOUND, HEAT AND LIGHT.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. A fork is tuned slightly above a sonometer, with which it makes 4 beats per second. The tension of the sonometer string is 7.45 kilogms; its length is 81.2 cms; and 112 cms of the string weigh 5.04 gms. Find the vibration number of the fork.

Prove the formula you employ.

2. Describe the construction and use of a Bunsen Photometer.

A photometer bench has 500 divisions, from zero at the standard candle to 500 at the light to be tested. If

the latter be a 16 candle power lamp what will be the reading when the screen is set?

It is found that when a plate of ground glass is interposed between the lamp and screen, the screen has to be moved 4 divisions nearer to the lamp. What percentage of the light is intercepted by the plate?

3. Describe the Astronomical Telescope.

(*a*) The object glass of a telescope has a focal length of 3 feet, and is turned towards a man 6 ft. high and 301 yards away from the lens. Where and how large will be the image it forms?

(*b*) The eye-piece has a focal length of 1 inch, and is pushed up to within 9-10 inch of the image formed by the object glass. Where and how large will be the image seen by the observer?

4. Explain the method of finding the angle of a prism by means of a spectrometer. Describe carefully the adjustments you would make before beginning the measurement.

5. What sources of error have to be considered in using a mercury thermometer for measuring temperature?

6. State Dalton's law of mixed gases, and explain it from what you know of the constitution of gases.

7. Define specific heat, and explain the difference between thermometric and latent heat calorimetry.

8. How would you determine the coefficient of expansion of air by means of the constant volume air thermometer? What is the correction for the expansion of the glass bulb?

9. Explain what is meant by Dew-point, Absolute and Relative Humidity. Describe briefly the action of the wet and dry bulb hygrometer.

10. How many gram-degrees of heat will be conducted in an hour through an iron bar 2 square centimeters in section and 4 centimeters long, its two extremities being kept at the respective temperatures of 100° C. and 178° C., the mean conductivity of iron being 0.12?

11. A steam engine indicates 25 H. P. How many units of heat does it convert into work per minute?

12. In a perfect engine heat is taken in at a temperature of 144° C., and is given out at a temperature of 36° C. What proportion of the heat is converted into work?

FOURTH YEAR.

EXPERIMENTAL PHYSICS, ELECTRICITY, AND MAGNETISM.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. On what does the electrical capacity of a condenser depend? Describe the construction and method of charging a Leyden jar. State what you know of the Leyden jar discharge.

2. Describe the action of the plate frictional machine. Explain clearly the action of the row of points used in such a machine.

Distinguish between the action of frictional and influence machines.

3. Explain how to compare the magnetic moments of two bar magnets by the method of deflections using

(*a*) end on position.

(*b*) broadside position.

4. Define the terms magnetizing force, intensity of magnetization, and total magnetic induction.

Describe the relation existing between the magnetizing force and the total induction produced in soft iron.

Contrast the magnetic properties of soft iron and steel.

What is magnetic hysteresis?

5. Explain the construction and action of an astatic mirror galvanometer.

Explain how its sensibility can be varied by means of the control magnet.

A battery of 2 volts sends a current through a galvanometer of 10,000 ohms in series with a resistance of 1 megohm. The deflection of the needle corresponds to 150 divisions of the scale. Find the current through the galvanometer to give a deflection of 1 division.

6. Show from first principles that the electrical power absorbed in a circuit is given by the product of the current and the potential difference.

Define the terms watt, watt hour, ampere hour.

A building is lighted from a supply station with 100 16 c.p., 110 volt lamps in parallel. Each lamp takes 6.6 amperes. Find

(*a*) The current flowing in the leads entering the building.

(*b*) The power absorbed in lighting.

(*c*) The cost per hour of the light, if 1,000 watt hours costs 45 cents.

7. How does the resistance of a conductor depend on its length and cross section?

Define the term specific resistance.

Calculate the diameter of a copper cable in order that a length of 1 mile should have a resistance of 3 ohms, given specific resistance of copper is 1.7 microhms.

8. State Faraday's laws of induced currents.

What is meant by the extra current at make and break?

What experiments would you devise to show the existence of the extra current at break?

9. Describe the construction and action of a Ruhmkorff Induction Coil.

What is the function of the condenser attached?

State clearly the differences in construction and use of an induction coil and a commercial transformer.

10. Explain the construction and use

(*a*è of an incandescent lamp.

(*b*) an arc lanp.

Compare the efficiency of these two sources of light.

How does the candle power of an incandescent lamp vary with the voltage?

11. A battery drives a small electric motor to which a brake is attached. How does the current supplied by the battery vary with the speed of the motor, and why?

A motor is driven at a distance by a battery of 110 volts. The total resistance in the lines is 3 ohms. The current in the line is 15 amperes. Find

(*a*) watts supplied by battery.

(*b*) watts lost in the line.

(*c*) efficiency of the transmission of power.

12. Describe the methods employed in

(*a*) duplex telegraphy,

(*b*) detecting electric waves by a coherer.

CHEMISTRY.

SECOND YEAR.

CHEMISTRY.

WEDNESDAY, APRIL 2ND:—AFTERNOON, 2.30 TO 5.30.

1. State the laws of chemical combination by weight and by volume. What are the reasons for assigning the formula H_2O to water, and what is meant by the statement that 16 is the maximum atomic weight of oxygen?

2. Describe the reactions by which the composition and the formula of ammonia gas are established. What is the main source of ammonium compounds, and how may ammonia be obtained from them?

3. Give an outline of the position which the elements carbon and nitrogen hold with respect to the mineral, the vegetable, and the animal kingdoms.

4. How is common salt transformed into washing soda; what are the by-products in this industry, and how are they utilised?

5. In what forms of combination does the element silicon occur in the mineral world? To what technical purposes are the silicates applied? Distinguish between mortar and cement.

6. Give a short account of the metallurgy and the chemistry of aluminium.

7. The specific heat of tin is 0.054, what is its atomic weight? Compare the result with the value found from the vapour density of its chloride which is 94.5, and show how the true atomic weight can then be obtained from the analysis of the chloride which contains 62.57 per cent. of tin and 37.43 per cent. of chlorine. [$Cl = 35.45$].

8. In what form is phosphorus found in nature? How is pure phosphoric acid produced, and how is it tested for?

9. What are the reasons for placing the elements carbon, silicon, tin and lead in the same group in the periodic table?

SECOND YEAR.

PRACTICAL CHEMISTRY.

THURSDAY, APRIL 3RD:— MORNING, 9 TO 1.

1. Determine the equivalent weight of the metal given to you by the method adopted in the case of copper. Give the details of the operation.

2. Determine the base and acid in each of the salt solutions and give a complete account of the method of analysis. Express every chemical reaction by means of an equation.

SECOND YEAR.

PRACTICAL CHEMISTRY.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 1.

1. Determine the equivalent weight of the metal given to you by the method adopted in the case of copper. Give the details of the operation.

2. Enunciate the law of multiple proportions. Describe in detail any experiment which you may have conducted in the laboratory illustrating the truth of the law.

THIRD YEAR.

ORGANIC CHEMISTRY.

TUESDAY, APRIL 8TH:—AFTERNOON, 2.30 TO 5.30.

1. Describe in detail one of the chief methods employed in the isolation of a pure substance. What tests are taken as criteria of purity and how are they made? Show how the composition, the formula and the molecular weight of a substance may be determined.

2. What are the main sources and the methods of preparation of the hydrocarbons?

3. Explain how the structural theory of chemistry accounts for the existence of ordinary isomerism and how it has been expanded to include the isomerism of such substances as the tartaric and the lactic acids.

4. What are the typical reactions which distinguish the hydrocarbons, the alcohols, the aldehydes, the ketones and the acids of the fatty series from each other?

5. What is the "Sandmeyer" reaction? Show how it may be employed in the production of chlorbenzene from benzene.

6. Contrast the methods of formation of amines in the marsh gas series with that of aromatic amines, and the action of nitrous acid upon these two classes of substances.

7. Distinguish between diazo-amido, amido-azo, and oxy-azo substances. How are they prepared?

8. How many derivatives of diphenyl methane be easily synthesised? What is the relationship between rosaniline and triphenyl methane?

9. How are the phenols and the naphthols prepared from their respective hydrocarbons?

10. Give proofs of the structural relationship that naphthalene and quinoline bear to benzene and pyridine respectively and to each other.

THIRD YEAR.

ANALYTICAL AND INDUSTRIAL CHEMISTRY.

THURSDAY, APRIL 10TH:—AFTERNOON, 2.30 TO 5.30.

1. A precipitate has been produced in a solution, and it is desired to ascertain its exact weight; describe carefully how this is done.

2. A sample of ferrous ammonium sulphate is submitted for analysis, describe how the percentage of Fe, *or* the percentage of SO_4, which it contains, may be determined.

3. Give in outline a gravimetric and a volumetric method for the determination of silver.

4. What is meant by a normal solution? Describe the preparation of normal sodium chloride solution.

5. How may an iodine solution be standardized? Describe an example of its use.

6. What are the principal sources of water used in industrial operations? What are the principal impurities in such waters, and how may they be removed?

7. Describe Barbier's tower system for the manufacture of sulphuric acid, *or* a method for the manufacture of fuming sulphuric acid.

8. Describe in outline one of the methods of preparing soda from salt.

9. Describe Dunlop's method *or* Weldon's method for manganese recovery in the manufacture of chlorine.

10. Describe an electrolytic method for the manufacture of chlorine.

FOURTH YEAR.

ORGANIC CHEMISTRY.

TUESDAY, APRIL 8TH:—MORNING, 10 TO 1.

1. Write a short account of the theory of radicles and the system of types.

2. Describe in detail a method for the quantitative estimation of carbon and hydrogen in an organic compound containing sulphur.

3. Compare and contrast the general properties of the paraffins with those of the acetylene hydrocarbons. Mention the occurrence and chief technical uses of the first named compounds.

4. Describe any convenient method of preparation of the monohalogen substitution products of the alkylenes and show by examples how the chemical behaviour is influenced by the position of the halogen atom in the molecule.

5. How may potassium ferrocyanide be obtained from the spent residues of the gas works? State what you know regarding its constitution and from it obtain the following compounds:—(*a*) Potassium cyanide, (*b*) Anhydrous prussic acid, (*c*) Urea, (*d*) Barbituric acid, (*e*) Amido malonic nitrile, (*f*) Cyanuric Acid.

6. Describe carefully the Fischer synthesis of uric acid, and explain how the constitutional structure of the substance has been established.

7. Give a complete proof of the equivalence of the hydrogen atoms in the benzene molecule.

8. Describe in detail the Friedel and Craft synthesis of benzene homologues. Discuss the behaviour of these compounds with (*a*) halogens and (*b*) oxidizing agents.

9. Give a mode of preparation and general properties of any four of the following bodies:—Diuretin, Antifebrin, Phenacetin, Lactophenin, Thiocarbanilide.

10. What is the Perkin reaction? Give examples and explain its mechanism.

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ELEMENTARY PLANT BIOLOGY.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 12.

1. Give a full account of the characteristics of the Chlorophyceæ with special reference to
   (*a*) Habits of growth.
   (*b*) Dominant colour.
   (*c*) Ability to fix carbon.
   Give a typical example.

2. Distinguish between the cytoplasm and the wall of the plant cell with reference to
   (*a*) Situation.
   (*b*) Chemical and Physical differences.
   (*c*) Typical reactions.

3. What phase of development is represented by the prothallus, and what special functions are performed by this organ?
   Compare the ferns and gymnosperms with respect to the development of this structure.

4. What evidences appear in the Bryophytes, of their derivation from aquatic plants?
   To what extent do such evidences appear in the seed plants?

5. Give as full an explanation as you can of the process by which plants obtain their supplies of carbonaceous food, and also the source of such food.

6. Compare the vegetative organs of Polytrichum and Selaginella with reference to
   (*a*) Number and kinds.
   (*b*) Situation.
   (*c*) Structure.
   (*d*) The phase of development represented.

7. Give a full description of the vascular bundle of the open, collateral type, and show how it originates.

8. Describe the reproductive process in Spirogyra, and show how parthenogenesis is exhibited.

9. Discuss the relative importance of cross and close fertilization in the maintenance of the species, and show what special influences may operate favourably or adversely.

BOTANY.

THIRD YEAR.

BOTANY.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

1. Compare the Myxomycetes and the Chlorophyceae with respect to
   (*a*) Constitution of the plant body.
   (*b*) Habits of life.
   (*c*) Relation to food supplies.

2. Give as full a statement as you can respecting the position of the Chlorophyceae with reference to the development of higher forms of plant life.

3. Discuss the nature of the evidence bearing upon the phylogeny of the Bryophytes, and show what types these plants were derived from.

4. To what extent do the Thallophytes and Bryophytes occur in the fossil form? Do their remains afford any satisfactory evidence of their phylogeny and for what reasons?

5. State the position of the following groups in the line of descent, and indicate their probable origin.
   Rhodophyceae.
   Basidiomycetes.
   Filices.

6. Describe the structure of the sporophyte in Anthoceros; compare homologous parts in the sporophyte of the fern, and show how the alterations there expressed may be explained.

7. Describe the Gametophyte of the fern. Show what characters indicate an aquatic origin, and compare the development of this structure as found in Selaginella. What is the special significance of the changes to be noted?

8. Compare the Bryophyte (Moss) with the fern, with respect to general organization and internal structure of the Sporophyte and point out the significance of the changes noted with respect to development.

9. Describe the structure, origin, distribution and purpose of stomata.

THIRD YEAR.

ZOOLOGY.

THURSDAY, APRIL 3RD:— MORNING, 9 TO 12.

1. Give a short account of the group Alcyonaria, describing the various methods by which different members of the group form their skeleton.

2. Write a short essay on the kidneys of the Annelida, Arthropoda and Mollusca, pointing out how far they are to be regarded as homologous structures.

3. Describe the various forms of gnathites met with amongst the Insecta, and show how far they can be derived from a single type.

4. Give a short description of the anatomy of Nautilus, and point out how its shell is related to that of Sepia, mentioning and describing any intermediate types known to you.

5. Give an outline classification of the group Asteroidea, giving the characters of the principal divisions, and show how these characters are related to the habits of the animals.

6. Describe the anatomy of a typical Polyzoan. The Endoprocta are often classed as Polyzoa. Criticise this view of their affinities, giving reasons for and against it.

7. Describe the brain of the Cat-fish, and compare it with that of the Dog-fish, showing as far as you can how the differences in structure are related to differences in function.

8. Describe the female reproductive organs of the Rabbit and contrast them with those of the Dog-fish, pointing out the differences and the resemblances.

THIRD YEAR.

ZOOLOGY.

PRACTICAL EXAMINATION.

THURSDAY, APRIL 3RD:—AFTERNOON, 2 TO 5.

1. Dissect the specimen A so as to display as much as

possible of the blood system. Mark with flag labels; the *left carotid artery*, the *fourth afferent branchial vessel* on the left side, and the last *epibranchial vessel*. Mark also with a flag label the left *Ductus Cuvieri*.

2. Examine and draw the specimen B. Refer it, as far as possible, to its place in the animal kingdom, giving reasons for your answer.

3. Stain and mount as a permanent preparation C. Identify and give reasons for the identification.

4. Identify the bones D. E. F., etc., provided.

FOURTH YEAR.

ADVANCED ZOOLOGY.

PRACTICAL EXAMINATION.

THURSDAY, APRIL 3RD:—AFTERNOON, 2 TO 5.

1. Dissect the specimen *A*, so as to expose as much as possible of the brain and cranial nerves.

Mark with flag labels the *olfactory lobes*, the *opthalmic* branches of the fifth nerve, the *cutaneous* branch of the fifth, and the *branchial* branches of the vagus.

2. Stain and mount as a permanent preparation the specimen *B*. Sketch it and identify it.

3. Cut a transverse section of the head of the tadpole provided. Mount it, sketch it, and write a short description.

4. Identify the Museum specimens *C D E* provided, giving reasons for your answers.

FOURTH YEAR.

ADVANCED ZOOLOGY.

THURSDAY, APRIL 3RD:—MORNING, 9 TO 12.

1. Compare the structure of a simple sponge like Leucosolenia with that of a more complex one like Euspongia. To which of these types are the fresh water

sponges (Spongilla, etc.), more nearly allied? Explain your statement.

2. Compare and contrast the Turbellaria and Trematoda, using generic and specific names to give definiteness to your statements, and keeping in view the structure, environment, and development of the groups under discussion.

3. The Tunicata were once regarded as Mollusca. Justify your view with regard to their position in the classification of animals.

4. Give a short account of the group Arthrodira, mentioning the principal points in their structure, and the grounds on which they are classed as Dipnoi.

5. Give an account of the group Dinosauria, noting especially those features in their anatomy in which they resemble birds. Discuss the affinities of the group.

6. Give an account of the skeleton of the hind limb in the group Ungulata, tracing the evolution of the later forms from the earlier forms.

7. Define the term *gastrulation*, and describe how the process designated is carried out (*a*) in the egg of Echinus, (*b*) in the egg of the Whelk or of a similar Mollusc, (*c*) in the Frog, (*d*) in a Reptile.

8. What is meant by the term *Rauber's layer?* Trace the effect which the development of this layer has had on the early development of Mammalia.

FOURTH YEAR.

BIOLOGY HONOURS.

VERWORN'S GENERAL PHYSIOLOGY.

MONDAY, APRIL 21ST:—MORNING, 9 TO 12.

1. Give the results of experiments which show that fats and carbohydrates can be manufactured out of proteid by living organisms.

2. Discuss the death of protoplasm, pointing out the various ways in which it can occur.

3. Give the various theories which have been put forward as to the first origin of life on the earth and discuss their validity.

4. Define the term *stimulus* and enumerate the various kinds of stimuli to which organisms are exposed under normal conditions. Give examples of the various kinds of reaction to the momentary electric current which different organisms exhibit.

5. What is meant by the term *tropism*. Give examples of various kinds of *tropism* and discuss and criticize Verworn's explanation of it.

6. Weismann, in order to account for the marvellous complexity of many animals, had assumed a correspondingly complex structure of the egg-nucleus. Give Verworn's explanation of how a complex adult animal can be derived from an egg of exceedingly simple structure. Point out the consequences of Verworn's view.

FACULTIES OF ARTS AND MEDICINE.

SUPPLEMENTAL EXAMINATION IN ELEMENTARY BIOLOGY.

ANIMAL BIOLOGY.

WEDNESDAY, APRIL 16TH:—AFTERNOON, 2.30 TO 6.30.

Students belonging to the Faculty of Medicine will answer only the first six questions and will be required to hand in their papers at 4.30 p.m.

1. Define the terms *defaecation*, *excretion* and *respiration* and show how they are carried out:—

(*a*) by Paramoecium.
(*b*) by Hydra.
(*c*) by the Dog-fish.

2. Describe the methods of reproduction which occur:—

(*a*) in Amoeba.
(*b*) in Hydra.
(*c*) in Lumbricus.

Compare them with one another and point out the resemblances and differences in the three cases.

3. Define the phrase *connective tissue* and point out whether or not the word *tissue* is here correctly used, giving the definition of the term *tissue* as used in zoology. Enumerate the chief varieties of connective tissue found in the Dog-fish, and state where they are developed.

4. Describe carefully the structure of the ear of the Dog-fish and mention the functions which the different parts carry out. Describe the structure of the cells, composing it as well as its gross anatomy.

What is the representative in the Dog-fish of the so-called outer and middle ear of Man?

5. Define the term gland? State what you know of the structure and functions of the liver of the Dog-fish.

Is the ovary a gland?

6. Describe the brain of the Dog-fish, mentioning the nerves which proceed from it, and the structures they supply, and the relation of the whole to the ectoderm.

7. Describe carefully, with diagrams, the skull of the Frog, pointing out how it has been derived from that of the Dog-fish.

8. Describe and compare the venous systems of the Frog and the Dog-fish.

9. Describe carefully the skeleton of the fore-limb of the Frog and compare it with that of the Dog-fish.

THIRD AND FOURTH YEARS.

GEOLOGY.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12 AND 2 P.M.

1. What do you understand by a Fault? Describe the two chief classes of Faults. Explain how Faults may be of the greatest importance in connection with mining. Illustrate your answers by sketches.

2. Give in tabular form the subdivisions of the Geological Column. Show where the earliest *Teleostei*, the earliest Reptiles and the earliest Birds appear, and where the Trilobites disappear.

3. State the mineralogical composition, the structure, origin and mode of occurrence of the following rocks:—*Conglomerate, Gabbro, Slate, Marble, Serpentine, Andesite.*

4. Draw a geological section down the length of the Ontario peninsula showing the succession and relation of the strata from the Laurentian highland to the west end of Lake Erie.

5. Explain the importance of Bedding and Jointing to the Quarryman. Illustrate your answer by sketches.

6. State what you know concerning the surface character, petrography, subdivisions and mineral resources of the Laurentian areas of Canada and the results of recent investigations into their structure.

7. State what you know concerning the following formations:—*Nova Scotia Gold Bearing Series, Potsdam Sandstone, Quebec Group, Niobrara Marls, Medina Sandstone, Corniferous Limestone.*

8. (*a*) State what you know concerning the Glacial Epoch in North America, writing of the expansion of the ice sheets, the character of their deposits, the forms of the stratified drifts, the glacial lakes, etc.

(*b*) The Old Red Sandstone; Age; Character of the Deposits; Conditions of Deposition; Distribution

in Europe and in Canada; Character of Life. Describe three fossils characteristic of the Series.

9. Draw a sketch map of the Continent of North America and show what portions of it were already dry land at the close of the Upper Silurian.

10. State what you know concerning the Coal Fields of the Dominion of Canada.

2 O'CLOCK P. M.

11. Name the fossils exhibited, and state the geological formation to which they belong.

12. Name and describe the rock specimens.

FOURTH YEAR.

HONOURS IN GEOLOGY AND NATURAL HISTORY.

PHYSIOGRAPHY—(*Second Paper*).

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. Explain the topographic development of the physical features shown on the Model.

2. Classify the Land Forms on Maps *A*, *B* and *C*. Comment briefly upon their origin and age.

3. Describe the origin and structure of, Alluvial Fans or Glacial Sand Plains, Domed Mountains, Baraboo Ridge. Illustrate by means of sketches.

4. State what you know concerning the topographic development of Acadia. Correlate Acadia with Southern New England.

5. Give in some detail a description of the origin and structure of Southern Central Ontario.

6. What factors should be considered in connection with climate?

(*a*) What do you understand by climatic control? Illustrate by means of the following countries, Chili, North Egypt and England.

FOURTH YEAR.

HONOURS IN GEOLOGY AND MINERALOGY. (THIRD PAPER) PRACTICAL GEOLOGY AND ORE DEPOSITS.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.30.

1. State briefly what you know concerning ore deposits of igneous origin.

2. Describe the Iron Ore deposits of Bell Island, Newfoundland, and refer them to their place in the classification adopted.

3. State what you know concerning the influence of the wall rock upon the character of mineral veins. Give examples.

4. What do you understand by a Replacement. Give a Canadian example of an ore deposit of this class.

5. Describe briefly the geological structure and the ore deposits of the Rossland camp.

6. State what you know concerning the Klondike deposits and refer them to their place in the classification adopted.

7. Describe the models exhibited. Mention two actual occurrences in which the structures displayed by the models are seen.

8. Give some practical rules for the recovery of faulted beds or veins.

9. What do you understand by the following terms:—Graben; Isoclinal; Step Faults; Slickenside; Shear Zone.

10. Describe the method of constructing a Horizontal Section.

FOURTH YEAR.

HONOURS IN GEOLOGY AND NATURAL HISTORY.

(FOURTH PAPER) PETROGRAPHY.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.30.

1. What structures are characteristic of the Volcanic and Plutonic rocks respectively?

2. State what you know concerning the order in which the constituents of a Plutonic rock crystallize out, and the law which governs this order. Give two examples.

3. Describe in detail the appearance presented under the microscope by each of the following rocks:—the Stenzelberg Andesite; the Obsidian from Obsidian Cliff; the Morin Anorthosite.

4. Describe briefly:—Pulaskite, Dunite, Diabase, Trachyte, Augite—Porphyrite. Refer these to their places in the petrographical classification.

5. Describe the Bar-Andlau contact Zone and the rocks of which it is composed.

6. Describe the optical properties and the appearance under the microscope of thin sections of Hornblende cut parallel to the following crystallographic faces respectively $\infty P \bar{\infty}$, $o P$, $\infty P /\infty$.

7. Describe in detail the petrographical character of the Breccia from St. Helen's Island.

8. Name the twenty hand specimens. What structures are exhibited by Nos. 17, 18, 19 and 20?

9. Examine the five thin sections under the microscope. State in each case what minerals are present as well as the name and structure of the rock.

FOURTH YEAR.

HONOURS IN GEOLOGY AND NATURAL HISTORY.

(FIFTH PAPER) CANADIAN AND ADVANCED GEOLOGY.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

1. State what you know concerning the origin and mode of occurrence of Chromite deposits. Where are deposits of this mineral worked in Canada?

2. State what you know of the geographical position, geological structure, and recent development of the Cape Breton Coal Fields.

3. Outline clearly the views recently put forward by Van Hise on the origin of Ore Deposits. How do they differ from those of Posepny?

4. Describe the physical features of the Western Border Basin.

5. State what you know of the stratigraphical position, petrographical character, and economic importance of the following series:—Atlantic Coast, Corniferous, Utica, Grenville and Windsor.

6. By appropriate correlations, show that, geologically, the Eastern Border Basin is closely related to Western Europe.

7. Draw a horizontal section across the region of the prairies from the Archaean axis to the Rocky Mountains. Briefly describe the Mesozoic as developed in this area.

8. State what you know of the Huronian as developed in the Sudbury-Temiscaming area. Name the economic minerals in the district and state their mode of occurrence.

9. Name the fossils exhibited and refer them to their proper formations.

FOURTH YEAR.

HONOURS IN GEOLOGY AND MINERALOGY.

(SIXTH PAPER) ADVANCED GEOLOGY.

TUESDAY, APRIL 22ND:—MORNING, 9 TO 12.

1. Give a succinct account of the geology of Palestine and of the influence which it exerted on the history of the Jewish people.

2. Give a sketch of Darwin's investigations on the formation of vegetable mould through the action of worms.

3. State what you know of the geological history of the Island of Montreal.

4. Discuss briefly the chief theories which have been put forward to account for glacial motion.

5. State what you know concerning the nature and origin of Hanging Valleys.

6. State what you know concerning the structure and origin of the following mountains:—Henry Mountains; the Pyrenees; the Mendip Hills; the Watsatch Mountains; Mount Johnson; the Rocky Mountains.

7. What are the four ways in which, according to Marr, lake basins are formed? Give examples of each class.

8. State what you know concerning the character and origin of the surface features of the great deserts of the earth.

9. Discuss briefly the contributions of the following writers to the literature of geological science:—Leonardo da Vinci; Robert Hooke; Nicholas Steno; John Ray; James Hutton.

10. State what you know concerning the position of the anthracite and bituminous coal beds, respectively, in the folds of the Appalachian Mountains and in the Belgian Coal Fields. What opinions have been put forward to account for these relations?

FOURTH YEAR.

HONOURS IN GEOLOGY AND NATURAL HISTORY.

MICROSCOPICAL PETROGRAPHY.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

1. Describe in detail the sections lettered *A*, *B* and *C*.

2. Give the name and structure of rock in sections 1 to 8.

ART HISTORY AND ARCHAEOLOGY.

B.A. EXAMINATION.

TUESDAY, APRIL 22ND:— AFTERNOON, 2.30 TO 5.30.

Candidates are expected to answer three questions in each Part, and are limited to eight questions in all.

In Part I, diagram-sketches—in pencil, if preferred, and not elaborate—may be given in place of lengthened description.

Part I.

1. In analyzing the architecture of Imperial Rome, what elements are derived from Greek Architecture, and what are characteristically Roman? How far do you consider Roman architecture to show advance upon that of Greece?

2. Compare Sta. Sophia (Constantinople) with St. Mark's (Venice), considered more especially from the constructive point of view, adding brief notes as to the history of the two buildings.

3. Trace the development of vaulting from Roman times through Romanesque to Early Gothic.

4. Give a brief account of the Cistercian Order, and estimate its influence upon contemporary architecture.

5. Give an architectural description of any two buildings of importance in the history of European architecture, one Romanesque, one Gothic;
or, alternatively,
Trace the development of Gothic vaulting in England from the end of the thirteenth to the beginning of the sixteenth centuries (inclusive).

6. What decorative forms are characteristic of the capital of column or shaft in (1) Classical; (2) Byzantine; (3) Romanesque; (4) Early Gothic architecture?

Part II. (Painting in Italy).

1. Give an account of Giotto's work as a painter, and estimate his influence upon the development of painting in Italy.

2. Write brief notes upon four of the following painters and their works: (1) Masaccio; (2) Fra Angelico; (3) Botticelli; (4) Signorelli; (5) Mantegna; (6) Giorgione.

3. Analyze the decorative scheme of the ceiling of the Sistine Chapel.

4. Describe critically three of Raphael's more famous Madonna pictures, adding the main facts of the painter's life.

5. Compare the work of Tintoret with that of Titian and of Paul Veronese.

ART HISTORY AND ARCHAEOLOGY.

(Ancient and Classic).

M.A. EXAMINATION.

TUESDAY, APRIL 22ND:— AFTERNOON, 2.30 TO 5.30.

(*Six questions only required.*)

1. Speaking of "the small piece of desert plateau opposite the village of Gizeh," Mr. Flinders Petrie says: "There may be seen the most enormous piles of building ever raised, the most accurate construction known, the finest masonry, and the employment of the most ingenious tools; whilst among all the sculpture that we know, the largest figure and also the finest example of technical skill with artistic expression both belong to Gizeh."

Consider this statement in detail.

2. Describe the sculpture of the continuous frieze of the Parthenon, explaining its position on the building, and discussing its meaning and its technical merits.

3. Discuss the representation of the human figure and of animals in Egyptian and Assyrian bas-relief.

4. Compare the Doric Order of Greek architecture with its earlier prototype in Egypt, and give a brief account of any three important Greek Doric temples.

5. Contrast the early work in sculpture of the Egyptians and the Greeks.

6. Discuss the influence of Scopas and of Praxiteles upon later sculpture of classic times.

7. Analyze the decorative and constructive elements of Roman Imperial architecture, and discuss how far these may be attributed to Greek influence.

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ENGLISH.

FIRST YEAR.

ENGLISH COMPOSITION.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 11.

1. Define the terms "sentence," "principal clause," "dependent clause," "phrase," and use your definitions to set forth the leading principles of punctuation. Illustrate with examples in each case.

2. Explain and illustrate the use of *shall* and *will*, *may* and *can*, *lie* and *lay*.

3. Distinguish between literary, colloquial, and local English, giving examples of each.

4. Illustrate the advantages of parallel structure in sentence building.

5. Give rules for the use of capital letters.

6. Define simple, compound, complex, loose, and periodic sentences, giving an example of each.

GEOLOGY AND MINERALOGY.

THIRD YEAR.

GEOLOGY.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12 AND 2 P.M.

1. What do you understand by a Fault? Describe the two chief classes of Faults. Explain how Faults may be of the greatest importance in connection with mining. Illustrate your answers by sketches.

2. Give in tabular form the subdivisions of the Geological Column. Show where the earliest *Teleostei*, the earliest Reptiles and the earliest Birds appear, and where the Trilobites disappear.

3. State the mineralogical composition, the structure, origin and mode of occurrence of the following rocks:—*Conglomerate, Gabbro, Slate, Marble, Serpentine, Andesite.*

4. Draw a geological section down the length of the Ontario peninsula showing the succession and relation of the strata from the Laurentian highland to the west end of Lake Erie.

5. Explain the importance of Bedding and Jointing to the Quarryman. Illustrate your answer by sketches.

6. State what you know concerning the surface character, petrography, subdivisions and mineral resources of the Laurentian areas of Canada and the results of recent investigations into their structure.

7. State what you know concerning the following formations:—*Nova Scotia Gold Bearing Series, Potsdam Sandstone, Quebec Group, Niobrara Marls, Medina Sandstone, Corniferous Limestone.*

8. (*a*) State what you know concerning the Glacial Epoch in North America, writing of the expansion of the ice sheets, the character of their deposits, the forms of the stratified drifts, the glacial lakes, etc.

(*b*) The Old Red Sandstone; Age; Character of the Deposits; Conditions of Deposition; Distribution in Europe and in Canada; Character of Life. Describe three fossils characteristic of the Series.

9. Draw a sketch map of the Continent of North America and show what portions of it were already dry land at the close of the Upper Silurian.

10. State what you know concerning the Coal Fields of the Dominion of Canada.

2 O'CLOCK P. M.

11. Name the fossils exhibited, and state the geological formation to which they belong.

12. Name and describe the rock specimens.

FOURTH YEAR.

GEOLOGY AND NATURAL HISTORY.

PHYSIOGRAPHY—(*Second Paper*).

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. Explain the topographic development of the physical features shown on the Model.

2. Classify the Land Forms on Maps *A*, *B* and *C*. Comment briefly upon their origin and age.

3. Describe the origin and structure of, Alluvial Fans or Glacial Sand Plains, Domed Mountains, Baraboo Ridge. Illustrate by means of sketches.

4. State what you know concerning the topographic development of Acadia. Correlate Acadia with Southern New England.

5. Give in some detail a description of the origin and structure of Southern Central Ontario.

6. What factors should be considered in connection with climate?

(*a*) What do you understand by climatic control? Illustrate by means of the following countries, Chili, North Egypt and England.

FOURTH YEAR.

GEOLOGY AND MINERALOGY.

(THIRD PAPER) PRACTICAL GEOLOGY AND ORE DEPOSITS.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.30.

1. State briefly what you know concerning ore deposits of igneous origin.

2. Describe the Iron Ore deposits of Bell Island, Newfoundland, and refer them to their place in the classification adopted.

3. State what you know concerning the influence of the wall rock upon the character of mineral veins. Give examples.

4. What do you understand by a Replacement. Give a Canadian example of an ore deposit of this class.

5. Describe briefly the geological structure and the ore deposits of the Rossland camp.

6. State what you know concerning the Klondike deposits and refer them to their place in the classification adopted.

7. Describe the models exhibited. Mention two actual occurrences in which the structures displayed by the models are seen.

8. Give some practical rules for the recovery of faulted beds or veins.

9. What do you understand by the following terms:—Graben; Isoclinal; Step Faults; Slickenside; Shear Zone.

10. Describe the method of constructing a Horizontal Section.

FOURTH YEAR.

GEOLOGY AND NATURAL HISTORY.

(FOURTH PAPER) PETROGRAPHY.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.30.

1. What structures are characteristic of the Volcanic and Plutonic rocks respectively?

2. State what you know concerning the order in which the constituents of a Plutonic rock crystallize out, and the law which governs this order. Give two examples.

3. Describe in detail the appearance presented under the microscope by each of the following rocks:—the Stenzelberg Andesite; the Obsidian from Obsidian Cliff; the Morin Anorthosite.

4. Describe briefly:—Pulaskite, Dunite, Diabase, Trachyte, Augite—Porphyrite. Refer these to their places in the petrographical classification.

5. Describe the Bar-Andlau contact Zone and the rocks of which it is composed.

6. Describe the optical properties and the appearance under the microscope of thin sections of Hornblende cut parallel to the following crystallographic faces respectively $\infty P \bar{\infty}$, $o P$, $\infty P \infty'$.

7. Describe in detail the petrographical character of the Breccia from St. Helen's Island.

8. Name the twenty hand specimens. What structures are exhibited by Nos. 17, 18, 19 and 20?

9. Examine the five thin sections under the microscope. State in each case what minerals are present as well as the name and structure of the rock.

FOURTH YEAR.

GEOLOGY AND NATURAL HISTORY.

(FIFTH PAPER) CANADIAN AND ADVANCED GEOLOGY.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 12.

1. State what you know concerning the origin and mode of occurrence of Chromite deposits. Where are deposits of this mineral worked in Canada?

2. State what you know of the geographical position, geological structure, and recent development of the Cape Breton Coal Fields.

3. Outline clearly the views recently put forward by Van Hise on the origin of Ore Deposits. How do they differ from those of Posepny?

4. Describe the physical features of the Western Border Basin.

5. State what you know of the stratigraphical position, petrographical character, and economic importance of the following series:—Atlantic Coast, Corniferous. Utica, Grenville and Windsor.

6. By appropriate correlations, show that, geologically, the Eastern Border Basin is closely related to Western Europe.

7. Draw a horizontal section across the region of the prairies from the Archaean axis to the Rocky Mountains. Briefly describe the Mesozoic as developed in this area.

8. State what you know of the Huronian as developed in the Sudbury-Temiscaming area. Name the economic minerals in the district and state their mode of occurrence.

9. Name the fossils exhibited and refer them to their proper formations.

THIRD YEAR.—(*Chemistry and Mining Courses.*)

MINERALOGY.

SATURDAY, APRIL 19TH:—MORNING, 9 TO 1.

1. What do you understand by symmetry as existing in crystals. Explain the classification of forms according to symmetry.

2. Give the characters of the Tetragonal System, enumerating the forms and giving the notation of the faces.

3. Explain the notation of the faces in the Triclinic System.

4. What is Pseudomorphism? In what ways are Pseudomorphs produced?

5. Give the names and composition of the more important Hydrous Oxides, and briefly describe any two species.

6. Give short descriptions of each of the following species:—Molybdenite, Marcasite, Tetrahedrite, Cassiterite, Spinel, Pyroxene.

7. Define any five of the following terms:—Parameter, Hemimorphism, Form, Biaxial, Orthotrisilicate, Bisilcate.

8. Describe carefully the oxydising and the reducing flames, stating upon what facts their peculiar properties depend and how they are produced with the mouth blowpipe.

9. Give the principal blowpipe tests for five of the following elements:—Fluorine, Phosphorus, Bismuth, Zinc, Arsenic, Mercury, Barium.

10. Write notes on the following:—(*a*) Determination of fusibility of minerals; (*b*) determination of action of Hydrochloric Acid on minerals; (*c*) determination of specific gravity of minerals; (*d*) determination of hardness of minerals.

11. Give the blowpipe characters of any five of the following minerals:—Barite, Malachite, Siderite, Chromite, Niccolite, Topaz, Pyrophyllite.

12. Describe two of the crystal models shown, giving the notation of the faces. Name also and describe any five of the mineral specimens.

CHEMISTRY AND ASSAYING.

SECOND YEAR.

CHEMISTRY.

WEDNESDAY, APRIL 2ND:—AFTERNOON, 2.30 TO 5.30.

1. State the laws of chemical combination by weight and by volume. What are the reasons for assigning the formula H_2O to water, and what is meant by the statement that 16 is the maximum atomic weight of oxygen?

2. Describe the reactions by which the composition and the formula of ammonia gas are established. What is the main source of ammonium compounds, and how may ammonia be obtained from them?

3. Give an outline of the position which the elements carbon and nitrogen hold with respect to the mineral, the vegetable, and the animal kingdoms.

4. How is common salt transformed into washing soda; what are the by-products in this industry, and how are they utilised?

5. In what forms of combination does the element silicon occur in the mineral world? To what technical purposes are the silicates applied? Distinguish between mortar and cement.

6. Give a short account of the metallurgy and the chemistry of aluminium.

7. The specific heat of tin is 0.054, what is its atomic weight? Compare the result with the value found from the vapour density of its chloride which is 94.5, and show how the true atomic weight can then be obtained from the analysis of the chloride which contains 62.57 per cent. of tin and 37.43 per cent. of chlorine. [$Cl = 35.45$].

8. In what form is phosphorus found in nature? How is pure phosphoric acid produced, and how is it tested for?

9. What are the reasons for placing the elements carbon, silicon, tin and lead in the same group in the periodic table?

SECOND YEAR.

PRACTICAL CHEMISTRY.

THURSDAY, APRIL 3RD:— MORNING, 9 TO 1.

1. Determine the equivalent weight of the metal given to you by the method adopted in the case of copper. Give the details of the operation.

2. Determine the base and acid in each of the salt solutions and give a complete account of the method of analysis. Express every chemical reaction by means of an equation.

SECOND YEAR.

PRACTICAL CHEMISTRY.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 1.

1. Determine the equivalent weight of the metal given to you by the method adopted in the case of copper. Give the details of the operation.

2. Enunciate the law of multiple proportions. Describe in detail any experiment which you may have conducted in the laboratory illustrating the truth of the law.

THIRD YEAR.—(*Chemistry Course.*)

INDUSTRIAL CHEMISTRY.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

1. Mention the principal solid fuels, and discuss their relative values for industrial purposes.

2. Give an outline of one of the principal methods for the manufacture of soda.

3. Describe one of the methods employed in the manufacture of salt.

4. Describe one of the successful methods for the treatment of "tank waste."

5. What are the principal sources of nitrates and how are they obtained from these sources?

6. How is Portland cement manufactured?

7. Tell what you know about the principal parts of the plant of a glass works, such as the one visited in Montreal.

8. Describe the manufacture of calcium carbide.

THIRD YEAR.—(*Chemistry Course.*)

ANALYTICAL CHEMISTRY.

WEDNESDAY, APRIL 2ND:—MORNING, 9 TO 12.

(*Answer ten questions only.*)

1. What is a normal solution as employed in volumetric analysis? How would you prepare a decinormal solution of Sodium Carbonate?

2. 25 c.c. of decinormal Sodium Hydrate solution was placed in a beaker, a few drops of an indicator were added, and a dilute solution of Acetic Acid (Vinegar) was run in from a burette until the Sodium Hydrate was just neutraized, 23 c.c. being required for the purpose, What percentage of Acetic Acid did the Vinegar contain?

3. How would you prepare and standardize a solution of Potassium Permanganate, or of Potassium Dichromate?

4. What precautions are to be taken in the drying and igniting of filters and precipitates?

5. Describe in detail the determination of the Lime in pure Cacium Carbonate.

6. How would you determine the Silver and the Copper in an ordinary Silver coin?

7. 0.5 grm. of Potassium Sulphate is weighed out, dissolved, and the SO_4 precipitated by means of Barium Chloride. The precipitate is found to weigh 0.6503 grm.; from this calculate the percentage of SO in the original substance, and also state what the error is.

8. Describe the estimation of Phosphorus in Steel by means of a standard solution of Potassium Permanganate.

9. Describe briefly two methods for the estimation of Carbon in Steel.

10. Draw up a scheme for the complete analysis of a sample of ore consisting of Chalcopyrite, Galena, Zinc Blende and Heavy Spar.

11. Describe the gravimetric estimation of Titanium in an Iron Ore, giving reasons for each step.

12. In a determination of Arsenic by the Pearce method, 0.5 grm. of ore was employed. For the titration 45 c.c. of Ammonium Sulphocyanate solution (5 grams per liter) were required. What was the percentage of Arsenic in the ore?

13. How would you determine the hardness of a sample of water?

14. How are free Ammonia, Albuminoid Ammonia, Nitrites and Nitrates in Water estimated? Explain the interpretation of the results.

FOURTH YEAR.—(*Mining Course.*)

ANALYTICAL CHEMISTRY.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. In the valuation of a Manganese ore by Bunsen's method 0.5 grm. of the ore was employed, and 21 c.c. of semi-normal Sodium Thiosulphate solution were required for the titration. What was the percentage of $Mn\ O_2$ in the ore?

2. Explain the action of Sodium Disulphate as an agent for the decomposition of various ores.

3. Point out the principal sources of error in the estimation of Copper by the Cyanide method.

4. State briefly how you would determine the Copper, Nickel and Iron in a matte containing these metals.

5. Explain Volhard's method for the estimation of Manganese.

6. Describe the colorometric estimation of Titanium (*a*) in an Iron ore and (*b*) in a Silicate.

7. How would you estimate the proportion of Ferrous Iron (*a*) in a soluble Iron ore and (*b*) in an insoluble Iron ore?

8. Describe the estimation of arsenic (*a*) in an ore, or (*b*) in a sample of Copper bullion.

9. State what you know with regard to the electrolytic determination of Lead and Antimony.

10. State briefly how a proximate analysis of Coal is made, pointing out the difficulties in the way of obtaining concordant results. Describe any form of calorimeter which may be employed for determining the heating power of the Coal.

FOURTH YEAR.

PHYSICAL CHEMISTRY.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Describe fully how you would determine the combining weights of potassium, chlorine, and silver? (Oxygen = 16.00).

2. Write a note on the exceptions to the law of Dulong and Petit. What is the law of isomorphism?

3. What conditions are necessary that a gas may b liquefied? How are critical temperature and critical pressure measured?

4. Deduce the equation $PV = RT$. What is the value of R in gram-centimeters and what in calories?

5. Describe carefully the determination of the molecular weight of iodine by Dumas' method, and of alcohol by Meyer's method.

6. What is meant by osmotic pressure, and how can it be measured?

7. Describe completely the measurement of conductivities of solutions, and the treatment of results. How would you measure the migration ratios of the ions of silver nitrate?

8. What volumes of hydrogen and oxygen at 17° C. and 750 m.m. are obtained by passing a current of 3.5 ampères through a dilute solution of sulphuric acid for 3 hours?

9. What methods are used in determining the relative strengths of acids and bases? On what does the strength of an acid depend?

10. What are the principal units used in electrochemical measurements? How would you prepare a standard, and how use it to determine the values of electro-motive forces?

11. Deduce the formula for the E. M. F. of a reversible cell. Calculate the E. M. F. of the battery H. (electrolyte) O.

($H_2 + O = H_2O + 68{,}000$ colories; $\frac{d\pi}{d\tau} = 0.00141$.)

THIRD YEAR.

ORGANIC CHEMISTRY.

TUESDAY, APRIL 8TH:—AFTERNOON, 2.30 TO 5.30.

1. Describe in detail one of the chief methods employed in the isolation of a pure substance. What tests are taken as criteria of purity and how are they made? Show how the composition, the formula and the molecular weight of a substance may be determined.

2. What are the main sources and the methods of preparation of the hydrocarbons?

3. Explain how the structural theory of chemistry accounts for the existence of ordinary isomerism and how it has been expanded to include the isomerism of such substances as the tartaric and the lactic acids.

4. What are the typical reactions which distinguish the hydrocarbons, the alcohols, the aldehydes, the ketones and the acids of the fatty series from each other?

5. What is the "Sandmeyer" reaction? Show how it may be employed in the production of chlorbenzene from benzene.

6. Contrast the methods of formation of amines in the marsh gas series with that of aromatic amines, and the action of nitrous acid upon these two classes of substances.

7. Distinguish between diazo-amido, amido-azo, and oxy-azo substances. How are they prepared?

8. How many derivatives of diphenyl methane be easily synthesised? What is the relationship between rosaniline and triphenyl methane?

9. How are the phenols and the naphthols prepared from their respective hydrocarbons?

10. Give proofs of the structural relationship that naphthalene and quinoline bear to benzene and pyridine respectively and to each other.

FOURTH YEAR.

ORGANIC CHEMISTRY.

TUESDAY, APRIL 8TH:—MORNING, 10 TO 1.

1. Write a short account of the theory of radicles and the system of types.

2. Describe in detail a method for the quantitative estimation of carbon and hydrogen in an organic compound containing sulphur.

3. Compare and contrast the general properties of the paraffins with those of the acetylene hydrocarbons. Mention the occurrence and chief technical uses of the first named compounds.

4. Describe any convenient method of preparation of the monohalogen substitution products of the alkylenes and show by examples how the chemical behaviour is influenced by the position of the halogen atom in the molecule.

5. How may potassium ferrocyanide be obtained from the spent residues of the gas works? State what you know regarding its constitution and from it obtain the following compounds:—(*a*) Potassium cyanide, (*b*) Anhydrous prussic acid, (*c*) Urea, (*d*) Barbituric acid, (*e*) Amido malonic nitrile, (*f*) Cyanuric Acid.

6. Describe carefully the Fischer synthesis of uric acid, and explain how the constitutional structure of the substance has been established.

7. Give a complete proof of the equivalence of the hydrogen atoms in the benzene molecule.

8. Describe in detail the Friedel and Craft synthesis of benzene homologues. Discuss the behaviour of these compounds with (*a*) halogens and (*b*) oxidizing agents.

9. Give a mode of preparation and general properties of any four of the following bodies:—Diuretin, Antifebrin, Phenacetin, Lactophenin, Thiocarbanilide.

10. What is the Perkin reaction? Give examples and explain its mechanism.

THIRD YEAR—(*Mining Course*).

QUALITATIVE ANALYSIS.

WEDNESDAY, APRIL 3RD:—AFTERNOON, 2.30 TO 5.30.

1. A substance of non-metallic appearance is submitted for analysis; describe how it is to be brought into solution for the determination of the metals contained in it.

2. What are the acids most commonly met with in minerals and metallurgical products? Tell how the presence of any three of these may be detected, giving directions for the preparation of the necessary solutions of the substance under examination.

3. What are the principal methods made use of in analysis in the dry way? Enumerate the results obtained in ordinary cases by the application of one of these methods.

4. Into what groups are the metals divided for purposes of analysis? Give the analytical characteristics of each group.

5. A solution contains nitrates of lead, copper, bismuth, and cadmium. Describe the course of the analysis for metals of this solution.

6. Point out clearly why the presence or absence of phosphoric acid and of chromium must be determined before proceeding to the analysis for the metals of the iron group.

7. A solution contains chlorides of magnesium, potassium and ammonium, and nothing else. How may the presence of each of these substances in the solution be demonstrated?

8. How are the following acids recognized in solutions: sulphuric, hydrochloric, hydrofluoric, silicic, phosphoric, nitric?

9. What do you consider to be the principal causes of inaccuracy in qualitative analysis? How may they best be avoided?

FOURTH YEAR.—(*Chemistry Course.*)

GAS ANALYSIS.

THURSDAY, APRIL 17TH:—AFTERNOON, 2.30 TO 4.30.

1. What precautions are observed in preserving gas samples for analysis? Describe any forms of gas reservoir used for the purpose.

2. Describe the limitations and errors in the use of the simple Hempel gas burette, and how these may be overcome. Describe the Winkler burette and give a case in which it would be employed.

3. A mineral contains "occluded" nitrogen which is completely evolved on heating. A determination has been made of the *volume* of gas obtained from a known *weight* of the mineral. What other information is necessary in order to find the percentage *by weight* of gaseous constituent present in the mineral?

4. Describe the apparatus for obtaining oxygen, hydrogen and electrolytic gas for explosion purposes. How would you decide whether to explode a combustible gas with air or oxygen, and whether electrolytic gas should be added to the mixture or not?

You are given a gas one volume of which contracts two volumes on explosion with excess of oxygen, and gives one volume of carbon dioxide, and you are required to find what it is. Show how this may be done.

5. Give the methods employed for estimating *three* of the following gases: (1) nitrous oxide; (2) hydrogen; (3) oxygen; (4) marsh gas mixed with hydrogen.

6. Devise means for performing *one* of the following estimations *without* employing special apparatus: (1) the carbon dioxide present in the air; (2) the total sulphur present in illuminating gas; (3) chlorine when present in minute amount.

THIRD YEAR.

ASSAYING.

TUESDAY, APRIL 15TH:—AFTERNOON, 2 TO 5.

1. Describe the construction and use of a good button balance. What weights are used? What is the weight of the rider? How is the beam graduated, and what do it's readings mean? What precautions would you take before using a balance and set of weights with which you were not familiar?

2. Describe fully the preparation of pure silver or pure gold for use in assaying.

3. What is meant by assaying with "checks"? Explain fully how you would use checks in the assay of silver bullion.

4. Describe any one method of assaying lead ores. What charge would you use for a galena with siliceous gangue?

5. In the previous example if you also wished to determine the amount of silver in the ore, what would you do? Give reasons for the method you adopt.

6. How would you prepare assay lead suitable for scorification assays?

7. 500 grams of ore for gold and silver assay, on being passed through a 100 mesh sieve, yielded 5 grams of pellets which would not pass through. The pellets contained 0.0050 grams of gold and no silver.

1 assay ton of the sifted ore gave on assaying a silver gold bead of 0.1200 grams, and after parting the bead weighed 0.0155 grams.

What was the assay value of the ore in ounces per ton of gold and silver?

8. Give a full account with charges and all necessary details of the method of assaying a siliceous gold ore containing pyrite.

FOURTH YEAR.

ELECTRO-CHEMISTRY.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. How would you measure a current by means of a copper voltameter? What volume of hydrogen and oxygen are given by the electrolysis of a dilute sulphuric acid solution, by a current of 2 ampères, acting for an hour?

2. The laws applying to gases, apply also to dilute solutions. What is meant by this?

3. Describe completely the measurement of conductivities of solutions and treatment of results.

4. What is the electro-chemical theory of the action which takes place in charging and discharging a zinc-copper accumulator? What is a gas battery?

5. Write a note on the separation of metals by electrolysis. What is the electro-chemical series?

6. How would you determine the amount of free chlorine in a solution? 25 c. c. of a silver nitrate solution exactly precipitate the chlorine in 0.1456 grams of potassium chloride. What is the strength of the silver nitrate solution? ($Ag = 108$; $N = 14$).

7. Describe the method of making calcium carbide, its properties and uses. How can the value of a specimen be determined?

8. Write a note on electro-plating.

MATHEMATICS.

FIRST YEAR.

MATHEMATICS, I.

THURSDAY, DEC. 19TH:—MORNING, 9 TO 1.

1. Inscribe a regular pentagon in a given circle.

2. Find the loci of the points of trisection of chords drawn through a fixed point in the circumference of a given circle.

3. Divide a straight line into two parts such that the sum of the squares on the parts may equal a given area.

4. In a triangle prove that the radius of the circumscribing circle is equal to the product of the lengths of the three sides divided by four times the area.

5. Prove, by two independent methods, that the bisector of the exterior vertical angle of a triangle divides the base externally into two segments which have to one another the same ratio as the other sides of the triangle have.

6. Describe a rectilineal figure which shall be similar to one and equal to another given rectilineal figure.

7. In a given plain find a point equidistant from three given points outside the plane.

8. The angle which a straight line makes with its projection on a plane is less than that which it makes with any other line that meets it in that plane.

9. A portion of a railway embankment is 350 ft. long and 18 ft. wide at the top, and 200 ft. long and 40 ft. wide at the bottom. If its height is 12 ft., how many cubic yards of earth does it contain?

10. Find the volume of a sphere.

11. How much of the surface of a sphere is visible from a point whose distance from the surface equals one diameter?

12. Tangents are drawn to a parabola from a point

Q without it. Prove (*a*) that they subtend equal angles at the focus, and (*b*) that the chord of contact subtends the same angle at the focus, that its projection upon the directrix subtends at Q.

13. The focus of a parabola is 1 inch from the directrix. A tangent is drawn at one extremity of the latus rectum. Find (*a*) the length of this tangent, and (*b*) the length of a focal chord drawn parallel to it.

14. Prove that the sum of the focal distances of any point on an ellipse is constant.

15. Find the locus of the centres of circles which touch two given intersecting circles, one internally and the other externally.

FIRST YEAR.

MATHEMATICS, II.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 1.

1. Factor
   (1) $x^6 - 25x^2 + 6\frac{1}{4} - \frac{1}{4}x^4$.
   (2) $x^3 - 39x + 70$.
   (3) $a^3 - b^3 - c^3 - 3abc$.
   (4) $(a-b)^3 + (b-c)^3 + (c-a)^3$.

2. Prove that
   (1) $\dfrac{a+\sqrt{a^2-1}}{a-\sqrt{a^2-1}} - \dfrac{a-\sqrt{a^2-1}}{a+\sqrt{a^2-1}} = 4a\sqrt{a^2-1}$
   (2) $\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} \times (5 - 2\sqrt{6}) = 1$
   (3) ${}^{n+1}C_r - {}^nC_{r-1} = {}^nC_r$

3. Solve the following equations:
   (1) $\left.\begin{aligned} \frac{x}{y} + \frac{y}{x} &= 2\frac{1}{2} \\ x + y &= 6 \end{aligned}\right\}$
   (2) $x + 2 = \sqrt{4 + x\sqrt{8 - x}}$
   (3) $3^{2x+3} - 55 = 28(3^x - 2)$
   (4) $\left.\begin{aligned} x^2 + xy + y^2 &= 84 \\ x + \sqrt{xy} + y &= 14 \end{aligned}\right\}$

4. If α and β are the roots of $p x^2 + q x + r = 0$, show that the value of

$$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} = \frac{q(3pr - q^2)}{p^2 r}$$

5. From 4 officers and 8 privates how many different groups of 6 can be chosen, (1) to include only 1 officer, (2) to include at least 1 officer.

6. Insert 15 arithmethical means between 23 and 71, and find the sum of the series.

7. Find the sum of 6 terms of the series $x + 3$, $3x - 6$, $5x + 12, \ldots$

8. Find a G. P. the sum of whose first and second terms is 5, and such that every term is 3 times the sum to infinity of all the terms that follow it.

9. If in the expansion of $(a + b)^n$ the coefficients of the 5th and 12th terms are equal,

(*a*) find the sum of the coefficients.

(*b*) write down the 7th term.

(*c*) show which term is the greatest when $a = 6$ and $b = 3$.

10. Find by means of the Binomial Theorem the value of $\sqrt[3]{66}$ to 4 places of decimals.

11. Represent the following complex numbers geometrically, and find their moduli and amplitudes:

$$-1 + \sqrt{-1}, \quad -1 + \sqrt{-3}.$$

Find the value of the complex numbers $(2, \pi)$, and $\left(1, -\frac{2}{3}\pi\right)$.

12. Prove De Moivre's Theorem.

13. Show that

$$\frac{(\cos\theta + i\sin\theta)^7}{(\cos\theta - i\sin\theta)^5} = \cos 12\theta + i\sin 12\theta$$

14. Solve by determinants the equations:

(1) $ax + by = a^2$
$bx - ay = ab.$

(2) $3x + 2y - z = 27$

$$x - y + 3z = 9$$
$$x - 2y - 4z = -36.$$

15. In the determinant

$$\begin{vmatrix} a_1 & b_1 & \ldots\ldots e_1 \\ a_2 & b_2 & \ldots\ldots e_2 \\ \ldots\ldots & \ldots\ldots & \ldots\ldots \\ a_5 & b_5 & \ldots\ldots e_5 \end{vmatrix}$$

what is the sign of the term $a_3\, b_4\, c_2\, d_5\, e_1$?

16. Show that

$$\begin{vmatrix} 3 & 1 & 5 & 2 \\ 2 & 5 & 7 & 3 \\ 8 & 9 & 1 & 4 \\ 6 & 15 & 21 & 9 \end{vmatrix} = 0$$

17. Solve the equation

$$\begin{vmatrix} a & a & x \\ m & m & m \\ b & x & b \end{vmatrix} = 0$$

FIRST YEAR.

MATHEMATICS, III.

MONDAY, APRIL 14TH:—MORNING, 9 TO 1.

1. Explain the meaning of the signs + and — when applied to lines and angles in a plane.

Show by a figure how to express the functions of $3\pi - \theta$ in terms of the functions of θ.

2. Express in terms of the functions of θ each of the following: $\sin 2\theta$, $\cos 2\theta$, $\tan \frac{\theta}{2}$, $\cos 3\theta$, $\cos \frac{\theta}{2}$, $\tan 4\theta$.

Prove the relations in the last two cases.

3. Prove that:

(1) $\dfrac{\operatorname{cosec} \theta}{\sec \theta} + \dfrac{\sec \theta}{\operatorname{cosec} \theta} = \sec \theta . \operatorname{cosec} \theta .$

(2) $\cos^6\theta + \sin^6\theta = 1 - 3 \sin^2\theta \cos^2\theta .$

(3) $\cos 4\theta = 8 \cos^4\theta - 8 \cos^2\theta + 1 .$

(4) $\dfrac{\cot^2\theta + \tan^2\theta}{\cot^2\theta - \tan^2\theta} = \sec 2\theta - \tfrac{1}{2} \tan 2\theta \sin 2\theta .$

(5) $\dfrac{\tan 2\theta \tan \theta}{\tan 2\theta - \tan \theta} = \sin 2\theta.$

4. What is the value of (*a*) $\sin(\sin^{-1} \frac{1}{3})$ (*b*) $\sin^{-1}(\sin \theta)$?

Prove that $\tan^{-1} \frac{1}{2} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{8} = \dfrac{\pi}{4}$.

5. Solve the following equations giving (*a*) the particular, (*b*) the general values of θ.

(1) $3(\tan^2\theta + \cot^2\theta) = 10.$

(2) $\sin 6\theta = \sin 4\theta - \sin 2\theta.$

(3) $\cos^{-1} x - \sin^{-1} x = \cos^{-1} x\sqrt{3}.$

6. In the plane triangle $A\,B\,C$ prove

(1) $\cos \dfrac{A}{2} = \sqrt{\dfrac{s(s-a)}{b\,c}}$

(2) $\dfrac{a-b}{c} = \dfrac{\sin \frac{1}{2}(A-B)}{\cos \frac{1}{2} C}$

(3) $\tan A + \tan B + \tan C = \tan A \tan B \tan C.$

(4) $\sin^2 A + \sin^2 B + \sin^2 C$
$= 2(1 + \cos A \cos B \cos C).$

7. The sides of a plane triangle are 4, 5 and 7. What is the angle between the sides 5 and 7?

Check your result by finding the area by two different methods.

8. In any right angled spherical triangle ($C = 90°$) prove

(1) $\cos a = \dfrac{\cos A}{\sin B}$

(2) $\cos A = \dfrac{\tan b}{\tan c}$

(3) An angle and the opposite side are of the same species.

9. In any spherical triangle prove

(1) $\cos a = \cos b \cos c + \sin b \sin c \cos A.$

(2) $\tan \dfrac{A}{2} \cot \dfrac{B}{2} = \sin(s-b)\operatorname{cosec}(s-a).$

(3) A side and the opposite angle are of the same

species when there is another side as near 90° as the given one is.

10. A pyramid each of whose slant faces is an equilateral triangle has a square base. Find the angle between any slant face and the base.

11. Write down the equations known as Napier's Analogies. Derive one of them.

12. The spherical excess of a triangle on the earth's surface is 2.5″. Taking the earth's radius as 3960 miles show that the area of the triangle is 190 miles.

13. In the spherical triangle in which
$a = 99° 40' 48''$, $b = 64° 23' 15''$, $A = 95° 38' 4''$
show that
$B = 65° 33' 10''$, $C = 97° 26' 29''$, $c = 100° 49' 30''$.

FIRST YEAR.

MATHEMATICS, IV.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. A body is projected along a horizontal floor with a speed of 10 feet per second, and comes to rest after moving over a distance of 20 ft.

(1) Find the accleration and the time.

(2) Find the coefficient of friction.

2. The weights of an Atwood machine are 3 and 5 pounds. How far do they move in the first half-second of the motion? Show that the tension of the string is $3\frac{3}{4}$ pounds.

3. In going one-quarter of the way round a circle, the speed of a point is increased from v to $2v$. Find the change of velocity, and indicate clearly, by means of a diagram, the angle which it makes with the original velocity.

4. A body weighing 25 lbs. can be supported on a smooth inclined plane by a force of 15 lbs. acting up the plane. What horizontal force would support it?

5. Show that a body would slide 15 ft. from rest down the plane of question 4 in $1\frac{1}{4}$ sec.

6. A sphere of 8 in. radius, and weighing 30 lbs., rests against a vertical wall, and is supported by a string 9

in. long connecting a point in the surface of the sphere with a point in the wall. Show that the tension of the string and the pressure against the wall are 34 and 16 pounds, respectively.

7. The apparent weights of a body when weighed from both arms of an unequal balance are P and Q. Find the true weight and the ratio of the arms.

8. A body of specific gravity $\frac{1}{3}$ is attached to another of half its volume, and the two just sink in water. Find the specific gravity of the latter body.

9. The volume of the receiver of an air pump is four times that of the barrel. After how many double strokes will the pressure be reduced to one-third of its first amount?

SECOND YEAR.

MATHEMATICS, I.

THURSDAY, DEC. 19TH:—AFTERNOON, 2 TO 5.30.

1. Assuming the curve $y = \sin x$, draw the curve $y = \sin^2 x$.

2. Show that the straight lines $A_1 x + B_1 y + C_1 = 0$, $A_2 x + B_2 y + C_2 = 0$, are perpendicular to each other if $A_1 A_2 + B_1 B_2 = 0$.

3. The co-ordinates of the angular points of a triangle ABC are $(-1, 2)$, $(3, 5)$, $(4, -3)$.

(1) Find the area.

(2) Find the co-ordinates of the centre of the circumscribed circle.

(3) Prove that $\cot A + \cot B + \cot C = 2$.

4. The following circles intersect in P, Q:

$$x^2 + y^2 - 6x + 2y - 6 = 0,$$
$$x^2 + y^2 + 4x - 2y - 4 = 0.$$

(1) Find the equation of PQ.

(2) Show that $PQ = 4\sqrt{\frac{35}{29}}$

(3) Show that the circle through P, Q, and the origin is $x^2 + y^2 + 24x - 10y = 0$.

(4) Find the equation and length of the line joining the centres of the given circles.

5. (1) Find the equation of the line which touches the parabola $y^2 = 8x$ and makes an angle $\tan^{-1} 2$ with $y = 3x + 1$.

(2) Show that this tangent touches the parabola at one extremity of the latus rectum.

6. Find the length of the normal at the point on $y^2 = 8x$ where the abscissa and ordinate are equal.

7. The area of an ellipse $= \pi ab$.

8. If any number of ellipses have a common major axis, tangents at points having a common abscissa all meet in one point.

9. (1) Find the eccentricity of the equilateral hyperbola $x^2 - y^2 = a^2$.

(2) Also find the equations of the asymptotes and the directrices.

10. The polar equation of the curve $(x^2 + y^2)^2 = a^2 (x^2 - y^2)$, (origin the pole, axis of x the polar axis), is $r^2 = a^2 \cos 2\theta$

11. Turn the axes of $x^2 - 4xy + 4y^2 = 5$ through an angle whose tangent is ½.

SECOND YEAR.

MATHEMATICS, II.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.30.

1. If $y = \sin^2 x \cos x$, then $\frac{d^2y}{dx^2} + 9y = 2 \cos x$.

2. Find the root of the equation $x^3 + 4x^2 - 7 = 0$, which is approximately equal to -3.4.

3. The greatest value of $\sin^2 x \cos x$ is $\frac{2}{9}\sqrt{3}$.

4. It is required to cut out four equal squares from the corners of a given square so that the remaining area (the edges being turned up) will form a rectangular box of greatest volume.

5. Show that:

(1) $\int_0^{\frac{1}{3}\pi} \sqrt{1-\cos\theta}\, d\theta = .379$ (4) $\int_1 \frac{dx}{\sqrt{4-x^2}} = 1.047$,

(2) $\int_0^{\frac{1}{4}\pi} \tan^2\theta \, d\theta = .215$, (5) $\int_1^2 \frac{dx}{x^2+4} = .161$,

(3) $\int_0^1 e^x \cos x \, dx = 1.378$, (6) $\int_0^4 \frac{dx}{\sqrt{x^2+9}} = 1.099$.

6. Show that :

(1) $\int x^2 \sin x \, dx = 2x \sin x + (2-x^2) \cos x$,

(2) $\int \frac{2x \, dx}{1+x+x^2+x^3} = \tan x + \log \frac{\sqrt{1+x^2}}{1+x}$.

7. Find the asymptotes of $xy^3 + 3y^3 = x^4$.

8. The radii of curvature of $y^3 - x^2y = x^4$ at the origin are $\frac{1}{2}$ and $2\sqrt{2}$.

9. Given the curve $y = x^4 - x^2$, show that :—

(1) The points of inflection are $\left(\pm \frac{1}{\sqrt{6}}, -\frac{5}{36}\right)$.

(2) The radius of curvature at the points where the curve crosses the axis of x is $\frac{1}{2}\sqrt{5}$.

(3) The centre of curvature for these points is $(0, \frac{1}{2})$.

(4) The area between the curve and the axis of x is $\frac{4}{15}$.

(5) The volume formed by revolving this area round the axis of x is $\frac{16}{315}\pi$.

10. Show that the moment of inertia of a triangle about its base is $\frac{1}{6} m h^2$, and that of a right circular cone about an axis through the vertex perpendicular to the geometrical axis is $\frac{1}{20} m (12 h^2 + 3 r^2)$, where h is the altitude, and r the radius of the base.

SECOND YEAR.

MATHEMATICS, III.

FRIDAY, APRIL 18TH :—MORNING, 9 TO 12.30.

1. A point starts from rest and moves so that the distance described at any time is always $\frac{1}{3}$ of the cube of the time.

Find its velocity at the end of $2\frac{1}{2}$ seconds.

2. A bullet moving at the rate of 200 feet per second

penetrates a block of wood to a depth of 9 inches. Show that if the block had been only 5 inches thick it would have emerged with a velocity of $133\frac{1}{3}$ feet per second, assuming the resistance to be uniform.

3. The weights of an Atwood machine are 5 oz. and 7 oz.; if a 4 oz. bar is placed on the lighter weight how far will they move in 3 seconds?

If the bar is then removed how long will they continue to move in the same direction?

What will be the tension in the string while the bar is on?

4. A balloon ascends with constant acceleration, so that a mass of 56 lbs. exerts a pressure of 84 pounds on the bottom of the car. When will it be 200 feet high?

If the mass is then dropped overboard in what time will it reach the ground?

5. Prove that the acceleration of a point moving with a uniform speed v in a circle of radius r is $\frac{v^2}{r}$

6. If a body attached to a string is whirled in a vertical circle prove that the difference of the tensions in the string at the highest and lowest points is equal to 6 times the weight of the body.

7. Prove that the motion of a simple pendulum swinging through a small arc is approximately simple harmonic.

Given that the length of a seconds pendulum is 39.12 inches, find the length of a pendulum that will vibrate in 2 seconds.

8. Find the theoretical value of the angle of elevation of a projectile for which the horizontal range is a maximum.

A shell bursts on striking the ground scattering its fragments in every direction with a velocity of v feet per second. Show that the area of ground covered by the fragments is $\frac{\pi v^4}{g^2}$ square feet, assuming that the shell falls on a horizontal plane.

9. State the conditions of equilibrium of any number

of forces acting (1) upon a point, (2) upon a rigid body,

A uniform beam weighing 32 lbs. rests with one end upon a horizontal plane, and the other upon a plane inclined at 60° to the horizontal. If the beam is kept in equilibrium by a horizontal string attached to the lower end, find the tension in the string, and the reactions of the planes.

10. Weights of 9, 5, 7, 4, 10 and 2 lbs. are hung in order at equal distances around the circumference of a horizontal ring 2 feet in diameter.

Find the position of their centre of gravity with reference to the centre of the ring.

11. A smooth rod a yard long rests over the edge of a vertical smooth hollow cylinder $2\frac{1}{4}$ inches in diameter, with one end against the inner surface. Show that in the position of equilibrium the rod is inclined at an angle of 60° to the horizontal.

12. Find the stresses in all the members of the accompanying figure.

Find the reactions graphically, and check the result.

THIRD YEAR.

MATHEMATICS, I.

THURSDAY, DEC. 19TH:—AFTERNOON, 2 TO 5.30.

1. If $dx = \cos\phi\ ds$, and $dy = \sin\phi\ ds$, show that

$$(d^2x)^2 + (d^2y)^2 = (d\phi\ ds)^2 + (d^2s)^2.$$

2. Find the root of the equation $x^5 - 12x = 200$, which is approximately equal to 3.

3. Obtain the differential expressions for the centre of curvature of a curve.

4. If the greatest possible cone is cut out of a given sphere, the height of the cone will be 2-3 of the diameter of the sphere.

5. Show that

(1) $\int_0^{\frac{1}{4}\pi} \tan_4\theta\ d\theta = .119$, (2) $\int_0^{\frac{1}{2}} \frac{dx}{\sqrt{1-4x^2}} = .785$

6. Show by the substitution $1 + x^2 = z^2$ that

$$\int x^3 (1 + x^2)^{\frac{2}{3}} dx = \tfrac{1}{63} (7x^2 - 2) (1 + x^2)^{\frac{7}{2}}$$

7. If $a \tan \theta$ be substituted for x show that

$$\int_0^\infty \frac{dx}{(a^2+x^2)^{\frac{n}{2}}} = \frac{1}{a^{n-1}} \int_0^{\frac{1}{2}\pi} \cos^{n-2} \theta \, d\theta,$$

and hence find the value of $\int_0^\infty \frac{dx}{(1+x^2)^3}$.

8. The area of the loop of $y^2 = x^2 (2x + 1)$ is $\frac{2}{15}$.

9. The volume of the solid formed by revolving the area between the curve $x = a (1 - \cos \theta)$, $y = a \theta$, and the line $x = 2a$ about the axis of y is $5 \pi^2 a^3$

10. Show that $e^x \sec x = 1 + x + x^2 + \frac{2}{3} x^3 + \ldots\ldots$

11. Show that

(1) $\dfrac{e^x - e^{-x}}{\log (1+ x)} = 2$ when $x = 0$.

(2) $(\sin x)^{\sec^2 x} = \dfrac{1}{\sqrt{e}}$ when $x = \dfrac{\pi}{2}$.

12. The semi-diameter conjugate to that passing through the point (x_1, y_1) on the ellipse is $\sqrt{a^2 - e^2 x_1^2}$.

13. Given the conic

$4x^2 + 15xy - 4y^2 + 8x + 15y = 0$, find:—

(1) The centre.

(2) The tangent of the angle which the principal diameters make with the co-ordinate axes.

(3) The equation of the curve referred to the principal diameters as axes.

THIRD YEAR.

MATHEMATICS, II.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. The force necessary to haul a train at uniform speed on a 1 p.c. grade is $3\frac{1}{2}$ times that on the level. Show that the coefficient of friction is $\frac{1}{250}$, approximately.

2. Find the number of turns of a rope round a post that a force of two pounds may hold a canal boat pulling with a force of one ton, the coefficient of friction being $\frac{1}{5}$.

3. (1) Find the efficiency of a screw in terms of the pitch angle β and the friction angle ϕ.

(2) Show that the efficiency is a maximum when $\beta = \frac{\pi}{4} - \frac{\phi}{2}$.

4. (1) An engine exerts a force of 300 pounds through a distance of 132 ft. on a car weighing 10 tons. The friction, etc., amounts to 10 pounds per ton. What is the final velocity of the car?

(2) How far will the car go if shunted on a side track with a 1 p.c. grade, the friction being the same as before?

5. A train weighs W tons and the resistances amount to p pounds per ton. Show that the horse-power necessary to propel it at a speed of V miles per hour up a grade of n p.c. is $\frac{W V (p + 20\, n)}{375}$.

6. Define instantaneous centre and centrode.

Find the centrode of a ladder which moves with one end on a vertical wall and the other on the horizontal ground.

7. A sphere rolls down a rough inclined plane. Find the acceleration of its centre.

8. Find the time of vibration of a compound pendulum.

9. A perfectly elastic ball falls from rest for one second and strikes a smooth plane inclined at 45° to the horizon. After what interval will it again strike the plane?

EXPERIMENTAL PHYSICS.

FIRST YEAR.

EXPERIMENTAL PHYSICS, SOUND, HEAT AND LIGHT.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. A fork is tuned slightly above a sonometer, with which it makes 4 beats per second. The tension of the sonometer string is 7.45 kilogms; its length is 81.2 cms; and 112 cms of the string weigh 5.04 gms. Find the vibration number of the fork.

Prove the formula you employ.

2. Describe the construction and use of a Bunsen Photometer.

A photometer bench has 500 divisions, from zero at the standard candle to 500 at the light to be tested. If the latter be a 16 candle power lamp what will be the reading when the screen is set?

It is found that when a plate of ground glass is interposed between the lamp and screen, the screen has to be moved 4 divisions nearer to the lamp. What percentage of the light is intercepted by the plate?

3. Describe the Astronomical Telescope.

(*a*) The object glass of a telescope has a focal length of 3 feet, and is turned towards a man 6 ft. high and 301 yards away from the lens. Where and how large will be the image it forms?

(*b*) The eye-piece has a focal length of 1 inch, and is pushed up to within 9-10 inch of the image formed by the object glass. Where and how large will be the image seen by the observer?

4. Explain the method of finding the angle of a prism by means of a spectrometer. Describe carefully the adjustments you would make before beginning the measurement.

5. What sources of error have to be considered in using a mercury thermometer for measuring temperature?

6. State Dalton's law of mixed gases, and explain it from what you know of the constitution of gases.

7. Define specific heat, and explain the difference between thermometric and latent heat calorimetry.

8. How would you determine the coefficient of expansion of air by means of the constant volume air thermometer? What is the correction for the expansion of the glass bulb?

9. Explain what is meant by Dew-point, Absolute and Relative Humidity. Describe briefly the action of the wet and dry bulb hygrometer.

10. How many gram-degrees of heat will be conducted in an hour through an iron bar 2 square centimeters in section and 4 centimeters long, its two extremities being kept at the respective temperatures of 100° C. and 178° C., the mean conductivity of iron being 0.12?

11. A steam engine indicates 25 H. P. How many units of heat does it convert into work per minute?

12. In a perfect engine heat is taken in at a temperature of 144° C., and is given out at a temperature of 36° C. What proportion of the heat is converted into work?

SECOND YEAR.

EXPERIMENTAL PHYSICS, ELECTRICITY AND MAGNETISM.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. On what does the electrical capacity of a condenser depend? Describe the construction and method of charging a Leyden jar. State what you know of the Leyden jar discharge.

2. Describe the action of the plate frictional machine. Explain clearly the action of the row of points used in such a machine.

Distinguish between the action of frictional and influence machines.

3. Explain how to compare the magnetic moments of two bar magnets by the method of deflections using

(*a*) end on position.

(*b*) broadside position.

4. Define the terms magnetizing force, intensity of magnetization, and total magnetic induction.

Describe the relation existing between the magnetizing force and the total induction produced in soft iron.

Contrast the magnetic properties of soft iron and steel.

What is magnetic hysteresis?

5. Explain the construction and action of an astatic mirror galvanometer.

Explain how its sensibility can be varied by means of the control magnet.

A battery of 2 volts sends a current through a galvanometer of 10,000 ohms in series with a resistance of 1 megohm. The deflection of the needle corresponds to 150 divisions of the scale. Find the current through the galvanometer to give a deflection of 1 division.

6. Show from first principles that the electrical power absorbed in a circuit is given by the product of the current and the potential difference.

Define the terms watt, watt hour, ampere hour.

A building is lighted from a supply station with 100 16 C.D., 110 volt lamps in parallel. Each lamp takes .66 amperes. Find

(*a*) The current flowing in the leads entering the building.

(*b*) The power absorbed in lighting.

(*c*) The cost per hour of the light, if 1,000 watt hours costs 45 cents.

7. How does the resistance of a conductor depend on its length and cross section?

Define the term specific resistance.

Calculate the diameter of a copper cable in order that a length of 1 mile should have a resistance of 3 ohms, given specific resistance of copper is 1.7 microhms.

8. State Faraday's laws of induced currents.

What is meant by the extra current at make and break?

What experiments would you devise to show the existence of the extra current at break?

9. Describe the construction and action of a Ruhmkorff Induction Coil.

What is the function of the condenser attached?

State clearly the differences in construction and use of an induction coil and a commercial transformer.

10. Explain the construction and use

(*a*) of an incandescent lamp.
(*b*) an arc lamp.

Compare the efficiency of these two sources of light.

How does the candle power of an incandescent lamp vary with the voltage?

11. A battery drives a small electric motor to which a brake is attached. How does the current supplied by the battery vary with the speed of the motor, and why?

A motor is driven at a distance by a battery of 110 volts. The total resistance in the lines is 3 ohms. The current in the line is 15 amperes. Find

(*a*) watts supplied by battery.
(*b*) watts lost in the line.
(*c*) efficiency of the transmission of power.

12. Describe the methods employed in

(*a*) duplex telegraphy,
(*b*) detecting electric waves by a coherer.

SECOND YEAR—(*Electrical Engineering.*)

PHYSICAL LABORATORY WORK.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. How would you determine the moment of a magnet by the Torsion balance?

2. How would you compare the moments of two magnets by oscillation?

3. Show how the formula of the tangent galvanometer is deduced, and calculate the current which would produce a deflection of 45° in such a galvanometer consisting of a coil of 30 turns and 50 cms mean diameter. The value of H may be taken as .150.

4. Describe the fall of potential method of measuring low resistances.

5. Show how the specific resistance of a copper wire of .001238 ohm resistance, 2 mms diameter, and 22.6 cms long may be calculated.

The temperature being 14° C. what would the value

be at 0° C.? taking the temperature coefficient of the copper to be .0038.

6. A potentiometer 5 metres long, is found to have a balance point for a Clark cell at 355.3 cms. A Weston Cadmium cell and a Lechlanché Cell balance at 252.85 and 325.03 respectively. Find the E. M. F. of these cells, taking the Clark as 1.430 volts.

7. Explain how you would construct a standard 1 ohm coil.

8. What is meant by the fundamental interval of a platinum resistance thermometer.

A platinum thermometer reads 257.0 box units in ice and 340 box units in steam at 99.95 C. Calculate the temperature coefficient of the platinum.

9. How would you determine
   (*a*) the resistance
   (*b*) the constant
of a D'Arsonval Galvanometer?

10. An electrolyte was found to have a resistance of 312 ohms. The cell in which it was measured contained 8 cc. The diameter of the tube was found to be 9 millimetres. Find the specific conductivity.

ELECTRICAL ENGINEERING.

THIRD YEAR.

ELECTRO-MAGNETISM.

FRIDAY, DEC. 20TH, 1901.

1. Explain fully the following terms: Unit pole, Unit field of force, Magnetic shell, Equivalent Magnetic Shell.

2. A loop of wire carries 2 amperes, the solid angle subtended by loop at a point P_1 is 1-8 of the surface of a sphere, and at a point P_2 , 1-4 of the surface of a sphere. What is the magnetic Potential at P_1 and P_2 ?

What work would be done in moving a pole of strength 12 between the two points?

3. An infinite straight conductor carries a current of 10 amperes. With what force would a pole of strength 5 be urged when at a distance of 8 centimetres from the conductor.

4. Given a cast iron ring 20 inches external diameter, and 18 inches internal diameter. With a 1-4 inch air gap, using attached saturation curves, find the number of ampere turns required to set up 180,000 lines in the air gap.

If the ring is cast steel find the change in the number of ampere turns for the same flux.

5. 100 cubic centimetres of well laminated iron are carried through a complete cycle of magnetization 130 times per second.

Maximum magnetic induction 18,000 lines per square inches.

Applying Steinmetz' law, what is the Hysteretic loss? $n = .002$.

6. A current of 2 amperes is sent through a solenoid consisting of one layer of 200 turns. Length of solenoid 20 centimetres, mean inside diameter, 1 centimetre. A search coil of 10 turns is wound over the middle of the

primary and connected to a ballistic Galvanometer. Resistance of search coil and Galvanometer 300 ohms. What quantity of electricity passes through the Galvanometer on breaking primary current?

7. Deduce an expression for the energy stored up in a magnetic field about a coil of wire, in terms of current in coil, and self induction of circuit.

THIRD YEAR.

D. C. DYN. MACHINERY.

MONDAY, APRIL 7TH:—AFTERNOON, 2 TO 5.

1. How are the ampere-turns on a given magnetic circuit to produce a given flux determined? Illustrate by example.

2. What are the causes of faulty commutation in direct current machines? State and discuss methods to insure sparkless commutation.

3. The armature and field resistances of a 110 volt 15 horse power motor after full load run are respectively .04 and .35 ohms; constant losses at rated speed, 460 watts; what is the efficiency at full load?

At 25 degrees Cent. the resistances of armature and field were measured and found to be .035 and .31 ohms respectively; what were the temperatures of armature and field.

4. State cause of hysteresis and eddy current losses in dynamos. What will be the loss in watts by hysteresis and eddy currents in a bipolar machine of 12 kilowatt capacity; r. p. m. 1200, volume of iron 11,000 cu. cm; induction 12,000 c. g. s. lines; thickness of disks in cm. .06; hysteretic constant .002?

5. What tests would you make on a constant potential d. c. generator to determine its value as a commercial machine?

6. Derive principal formulae used in predetermining leakage coefficient of dynamos. Give experimental methods of determining same.

FOURTH YEAR.

ELECTRIC LIGHTING.

THURSDAY, DEC. 19TH, 1901.

1. Describe and illustrate fully the different methods of feeder regulation for A.C. and D.C. distribution.

2. A pair of mains, 1,000 feet long, joining two feeding points No. 1 and No. 2, working under a potential of 110 volts, carries a maximum load of 450 amperes, equally distributed in 9 points at distances respectively from feeding point No. 1, of 150, 250, 350, 500, 550, 600, 700, 800, 900 feet. Maximum drop of voltage not to exceed 2 p.c. Find size of mains and C^2R loss in mains?

3. An aerial line consisting of 6 No. 2 B. and S., bare copper wire, turns through an angle of 30^0 at a pole. Poles are set 120 feet apart. Sag of wire 10 inches. Height of wires from ground 30 feet. Find the bending moment on the pole at the point where it enters the ground.

4. 100 K. W. at 2,400 volts single phase, are to be delivered a distance of 4 miles. Size of conductors No. O. B. & S. Distance between the wires 24 inches. Power factor of load .85; 7,200 alternations. Find the line drop and energy loss?

5. State and discuss principal methods for experimentally ascertaining the more important characteristics of D. C. & A. C. Generators.

6. The primary resistance of a 10K.W. Transformer is 2 ohms, Secondary resistance .02 ohms, Core loss 100 watts. Impedance on short circuited secondary 10 ohms. Calculate the efficiency and regulation at full load.

7. The probable load on an electric light and power plant being ascertained.

Discuss the conditions affecting:

1. The emplacement of the Power House.
2. The weight and size of feeders and mains.
3. The generator and receiver voltages.

THIRD AND FOURTH YEARS.—(*Electrical Engineering.*)

ELECTRICAL MEASUREMENTS.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

(*Third Year to omit question 11. Fourth Year to omit question 1.*)

1. Describe, in detail, the oscillation experiment in the determination of the horizontal component of the earth's magnetism by the magnetometer method.

Discuss the nature and magnitude of the corrections to be applied.

2. Explain the method of accurately measuring small angular deflections by means of a telescope and scale.

Explain, with details, how you would set up the telescope and scale.

What is the order of the error made in assuming that the deflection is proportional to the angular movement of the needle?

3. Show how to determine the dimensions of the units of current, resistance, potential, and inductance in electro-magnetic measure.

Explain how the E. M. F. of a Clark cell has been determined in absolute measure.

4. Show how the magnetic field varies along the axis of a straight uniformly wound solenoid conveying a current.

A solenoid 50 cms long, 4 cms in diameter, is uniformly wound with 2,000 turns of wire. A secondary coil of 300 turns is wound close over it near its centre. Find the coefficient of mutual induction between the two coils.

5. Explain how you would verify experimentally the coefficient of mutual induction calculated in question (4) using a condenser of known capacity to standardize the ballistic galvanometer.

Explain also how the strength of the magnetic field between the flat pole pieces of an electro-magnet could be accurately measured.

6. Define the terms magnetizing force, intensity of magnetization, total magnetic induction, and permeability.

Explain the connection between these quantities, and how their values vary as the magnetizing force acting on a specimen of soft iron is increased from zero to the highest known value.

7. Describe the methods employed in an accurate study of the hysteresis loss of a specimen of transformer iron for different inductions, using the ballistic method.

8. State the main points to be observed in the calibration of electrical instruments.

How would you determine accurately the constant of a Kelvin current balance?

What is the effect of a stray magnetic field upon it?

9. Describe the construction and use of a low resistance standard, capable of conveying large currents.

Show how to measure with accuracy the resistance per foot of an ordinary steel rail.

10. Discuss the advantages and drawbacks of the amyl lamp as a secondary photometer standard.

State what you know of the construction and efficiency of the Nernst lamp.

11. Describe two alternating current methods for determining the self-inductance of any given coil of wire.

Can the self-inductance of an electro-magnet be determined with accuracy by the Wheatstone bridge method?

FOURTH YEAR.

ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.

MONDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. A reactive coil shall give 100 volts E.M.F. of self-induction at 10 ampères and 60 cycles. The electric circuit consists of 200 turns of No. 8 B. & S. ($s = 0.013$ sq. in.), mean length of one turn 16″. The magnetic circuit has a section of 6 sq. in. and a mean length of 18″ of iron of hysteretic coefficient $\eta = 2.5 \times 10^{-3}$.

An air gap is interposed in the magnetic circuit of section 10 sq. in. (allowing for spread) to get the desired reactance. How long must the air gap be and what is

the resistance, reactance, effective resistance, effective impedance and the power factor of the coil?

A constant potential of 10 volts is applied to above coil, required time for current to reach $\frac{1}{2}$ its final value?

2. In a 20 k. w. transformer the ratio of turns is 20:1, the secondary terminal voltage is to be 100 when the secondary circuit is closed by an impedance $Z = 0.3\text{-}0.4\,j$ primary induced voltage = 2000, exciting current $I^1_{00} = 0.3 + 0.4\,j$ ampères, primary impedance $Z_0 = 2\text{-}5\,j$ ohms, secondary impedance $Z_1 = 0.004\text{-}0.01\,j$ ohms, required the primary current, primary impressed E.M.F. and primary lag?

3. At constant field excitation corresponding to a nominal induced E.M.F. of 12,000 volts a single phase generator of synchronous impedance $Z_0 = 0.6 - 60\,j$ ohms feeds a non-inductive receiver circuit over a transmission line of impedance $Z_1 = 12 - 18\,j$ ohms, shunted across the middle by a condenser of capacity susceptance 0.003 ohms, what will be the voltage e at the receiving end and the voltage at the generator terminals e_0 for the following values of current i in receiver circuit $i = 0$, $i = 50$ ampères, $i = 100$ ampères?

4. What are the A.C. and D.C. E.M.F. and current relations in a 3 phase synchronous converter?

By armature heating and neglecting internal machine losses, what is the rating of a 6 phase converter as compared with the rating of the same machine as a direct current generator?

5. In a 3 phase induction motor given:

$e = 110$

$y_1 = 0.01 + 0.1\,j$

$z_1 = 0.1 - 0.3\,j$

$z_2 = 0.1 - 0.3\,j$

Where e = primary counter E.M.F. per circuit

y_1 = admittance of primary per circuit at open secondary

z_1 = primary self-inductive impedance per circuit

z_2 = secondary self-inductive impedance per circuit reduced to primary.

What is the primary impressed E.M.F., primary current, torque in synchronous watts, torque efficiency, power output, apparent efficiency, efficiency and power factor for a slip of 5 per cent.

FOURTH YEAR.

STREET RAILWAYS.

FRIDAY, APRIL 11TH:—

1. Given the number and weight of cars, time schedule, cost of power and copper and track data, show how the conducting system is calculated.

2. What data must be available and how is it used in the proper selecion of railway motors for a proposed service?

3. A 12 ton car is fitted with two motors; when drawing 50 ampères, motors in series, the torque per motor is 2,400″ lbs.; diameter of wheels 33″, velocity ratio 4.78; mechanical efficiency 85 p.c.:—

(*a*) What is the tractive effort?

(*b*) If 15 lbs. per ton is the tractive coefficient, at what rate is the car accelerated?

(*c*) If current remains constant, how long will it take to get up a speed of 10 miles per hour?

4. The same car running at 20 miles per hour is to be brought to a standstill in 10 seconds by means of brakes. What pressure should be exerted by the brake shoes at rim of each wheel, single truck equipment?

5. Discuss the advantages of motor cars coupled in train form over trains drawn by electric locomotives.

6. Enumerate and describe the tests that should be made on railway motors to determine their more important characteristics.

7. Sketch and discuss the construction of standard electric road beds of the present day. How would you test rail joint resistance? Discuss different methods for improvement of track return.

8. Show how the booster system, used for the operation of long feeders, if judiciously applied, will save investment in copper.

9. Characterize the good and bad qualities of Alternating current motors for railway work.

Describe methods of control for these motors.

CIVIL ENGINEERING AND APPLIED MECHANICS.

THIRD YEAR.

GRAPHICAL STATICS.

MONDAY, DECEMBER 16TH, 1901:—MORNING, 9 TO 1.

(*Seven questions only may be attempted, the marks obtainable are attached to each question.*

Compression members in both frame diagram and stress diagram are to be marked by thick black lines. The stresses need not be tabulated.)

1. A chain of equal links is loaded at each joint in the manner shown in Fig. 1. The load at *A* is 5,000 pounds and is inclined at 30° to the vertical. Determine the loads at the other joints and the stresses in the links. (8)

2. One side of a step ladder is loaded in the manner shown by Fig. 2. Determine the stresses in the different members of the frame and in the horizontal cord. (8)

3. A girder, 50 feet long, is loaded in the manner shown by Fig. 3. Draw the Shearing force and bending moment diagrams. Make a bending moment scale for the bending moment diagram and from it determine the B.Ms. at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ span. (12)

4. A cantilever, Fig. 4, is loaded as shown. Determine the stresses in all the members by the method of sections. (10)

5. Determine the stresses in all the members of the crane shown in Fig. 5, in which the bracing consists of isosceles triangles having equal bases upon an outer arc subtending 90° at its centre. (11)

6. A crescent-shaped roof, having a roller support at the right-hand end, is loaded with normal wind loads as shown in Fig. 6. Determine the stresses in all the members. (14)

7. A flat-topped roof, having the main lower chords

AB, *BC* equally divided, is loaded in the manner shown in Fig. 7. Determine the stresses in all the members. (18)

8. A bicycle, shown in Fig. 8, carries a rider weighing pounds. Determine the stresses in the members of the frame (1) when all the weight is carried on the saddle, (2) when all the weight is carried on the treadles.

Note.—The members *AB*, *CD*, intersect in a point vertically above the centre of the leading wheel. (13)

9. Rectangular blocks are placed one upon the other in the manner shown by Fig. 9. The material of the blocks weighs 50 pounds per cubic foot. Determine the line of resistance (1) when there is no wind pressure, (2) when there is a wind pressure of 50 pounds per square foot acting horizontally upon the vertical face. (20)

10. A gauge plate of uniform thickness has the dimensions shown in Fig. 10. Determine the position of its centre of gravity. (12)

THIRD YEAR.

TESTING LABORATORY.

THURSDAY, APRIL 10TH:—AFTERNOON, 2 TO 5.

(*Six questions only to be attempted.*)

1. Describe, by aid of sketches, the construction of the Buckton testing machine in the laboratory and explain how it is used for making (*a*) tension tests, (*b*) compression tests, (*c*) bending tests.

2. In a tensile test of a bar of material, the following observations were made:

Original length	=	8.00 inches
Final length	=	10.02 "
Original diameter	=	1.03 "

Diameter at fracture = 0.83 "

Load in lbs.	Extension in ins.	Load in lbs.	Extension in ins
0	0	24000	.18
4000	.0015	28000	.26
8000	.0029	32000	.43
12000	.0044	36000	.55
16000	.0061	37000	.78
20000	.0077	38500	2.03
23500	.0091		

Calculate the intensity of stress at the elastic limits at rupture, the reduction of area per cent., and Young's Modulus of Elasticity (E).

3. Write a short description of the Torsion testing machine in the laboratory and the apparatus used for measuring strain.

A steel bar having a diameter of 0.410 inches and a length under test of 4.00 inches, gave the following results in the testing machine:

Torque, inch lbs.	Angle of twist.
150	1° 1′
300	2° 3′
450	3° 5′
600	4° 6′

Calculate the modulus of rigidity from these observations.

4. Describe how you would determine the moment of inertia of an irregular section about its neutral axis. Illustrate your answer by reference to the case of an I beam section in which the web is of uniform thickness and the flanges are thicker at the centre than at the extreme ends.

5. Deduce a general expression for determining the efficiency of a machine. Determine the efficiency, at different loads, of the hoisting tackle in the testing laboratory from the following data:

Velocity ratio = 31

Load in lbs.	Pull on chain in lbs.
200	16.0
400	20
600	24
800	30
1200	45

6. Describe one form of extensometer for measuring the alteration in length of a bar in the testing machine.

7. A gas pipe having an external diameter of 1.00 inches, and an internal diameter of 0.70 inches was subjected to test from which the following data were obtained:

Beam freely supported at each end, 45 inches spare; load applied at the centre.

Load in lbs.	Deflection in ins.	Load in lbs.	Deflection in ins.
0	0	60	.094
10	.015	70	.110
20	.030	80	.127
30	.046	90	.142
40	.062	100	.158
50	.078		

Calculate the modulus of elasticity of the material.

8. Describe an apparatus for testing the correctness of the indications of a pressure gauge and, in particular, explain why the loaded piston should be kept rotating during the test.

9. What difference in behaviour would you expect to find in making a tension or bending test of a piece of steel, if (*a*) the bar had not been subjected to stress before, (*b*) the bar had been overstrained immediately before.

Draw stress strain diagrams in both cases for a cyclical loading not great enough to pass the primitive elastic limit and account for the differences in their forms.

10. Describe shortly the principal tests made in testing the quality of a cement and point out what precautions are necessary to produce accurate results.

11. Describe what mechanical tests you would make in order to test the quality of a number of plates intended for use in boiler work.

12. A model for illustrating shear, consists of a frame of four equal bars, each 16 inches in length pivoted at the ends, and connected at diagonally opposite corners by springs. When one side is fixed and the opposite side is subjected to stress in the direction of its length, the following observations were obtained:

Load in lbs.	Movement of side.	Extension of 1st. diagonal and compression of 2nd. in ins.
0	0	0
2	.44	.30
4	.88	.61
6	1.31	.89
8	1.77	1.19

Deduce the modulus (C) for this frame and show that the longitudinal strain is one-half the shear strain.

THIRD AND FOURTH YEARS.—(*Civil Engineering.*)

MUNICIPAL ENGINEERING.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

1. Describe the construction and operation of (*a*) a Septic Tank, (*b*) a Contact Bed system of sewage disposal.

What is the essential difference between these processes and that of Intermittent Filtration?

2. In a chemical analysis of sewage explain briefly what is meant by "Albuminoid Ammonia," "Free Ammonia," "Oxygen Absorbed."

Why does the percentage of dissolved oxygen in sewerage decrease towards the outlet?

3. Under what circumstances is underdrainage of a sewage system necessary? How is it accomplished?

4. A drainage area in a suburban district is 80 acres in extent and the average surface slope, which is fairly uniform, is .5 per cent. The maximum rate of rainfall

to be provided for is 3 inches per hour. What should be the capacity of a sewer to carry away the storm flow?

5. A 15 inch circular sewer laid with a uniform slope of .5 ft. per 100 ft. is discharging at the rate of 4 cubic feet per second. Find the depth and mean velocity of the sewage.

What inclination should this sewer have in order to run just full?

6. Describe the manufacture of vitrified earthenware sewer pipe.

7. Describe with sketches (*a*) three different kinds of catch basins, (*b*) a Shone Ejector.

8. What is the object of ventilating a system of sewers, and by what means is it accomplished?

9. When sewage is to be discharged into a stream how would you determine whether any artificial treatment would be necessary?

10. What are the factors affecting the proportion of the rainfall which reaches the sewers or drains?

11. State what you consider to be approximate values of the following: (*a*) minimum inclination for a 15 inch sewer, (*b*) number of people per acre in the residential portion of a city, (*c*) value of *n* in Kutter's Formula, to be used for pipe sewers in average condition, (*d*) maximum rate of rainfall in this vicinity for periods of not less than one hour, (*e*) daily consumption per capita of water in cities and towns.

THIRD AND FOURTH YEARS.

THEORY OF STRUCTURES.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 1.

Candidates may attempt ten questions only.

1. Define the terms, *stress*, *strain* and *modulus of elasticity*.

A steel bar, 15 ft. long and 2 inches in diameter, is stretched .028 inches by a load of 15,000 pounds applied along the axis. Find the intensity of stress on the cross

section and the coefficient of elasticity (E) of the material.

2. The ram of a pile-driver weighs 4,000 pounds and falls a distance of 16 feet, thereby causing the pile to sink 4 inches.

Assuming the pile to weight 1,000 pounds and neglecting the elasticity of the pile, find the average resistance of the earth.

3. State the assumptions which are made in proving the formula

$$\frac{p}{y} = \frac{M}{I} = \frac{E}{R}$$

for the strength of beams loaded transversely, and explain in what way they are inaccurate.

In the case of a built up beam having equal flanges of area A and a web of area W, show that, approximately,

$$M = pd\left(A + \frac{W}{6}\right).$$

where d = distance between the centres of gravity of the flanges.

Calculate the area of the flanges of a girder when M = 550,000 in lbs. and feet, d = 3.2 feet, p = 14,000 pounds per square inch, and the web has a total area of 15 square inches.

4. Determine the moment of resistance of the plate girder whose section is shown in Fig. 1, when the allowable stress is 12,000 pounds per square inch. Web plate = $29'' \times \frac{1}{4}''$; flange plates = $12'' \times \frac{1}{2}''$; angles = $5'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$.

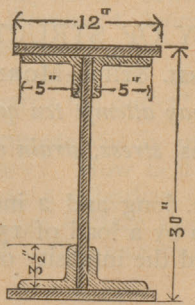


FIG 1

Also determine the safe load per foot run for a girder of this section having a clear span of 20 feet.

5. Show that if a bar is subjected to a direct load P and a bending moment, M, the stress at any point of the section is given by the formula

$$p = \frac{P}{A} \pm \frac{My}{I}$$

A circular link of a chain, having an internal diameter of 3 inches, is made of iron having a diameter of 1 inch and one side is cut through. Determine the maximum and minimum stresses in the link when the chain is loaded with 1,000 pounds.

6. Prove the formula

$$\frac{d^2y}{dx} = \frac{1}{R} = \frac{M}{EI}$$

and state the nature of the approximation made.

From your formula deduce expressions for the slope and deflection at the end of a cantilever of rectangular section, having a length of 60 inches, a breadth of 2 inches and a depth of 3 inches, when loaded uniformly with 100 pounds per foot run. $E = 30{,}000{,}000$.

7. Show that the diameter of a shaft to transmit a given horse-power H.P. at N revolutions per minute, when the allowable stress is q pounds per square inch, can be expressed in the form

$$d = c \sqrt[3]{\frac{HP}{qN}}$$

where c is a constant.

From your formula deduce the diameter of a shaft to transmit 300 horse-power at 200 revolutions per minute when the allowable stress is 10,000 pounds per square inch.

8. Show that when a belt is on the point of slipping over a pulley, the tensions at the ends are connected by the equations

$$\frac{T_1}{T_2} = \epsilon^{\mu\theta}$$

where θ = the angle of wrapping

μ = the coefficient of friction.

A strap is hung over a fixed pulley and is in contact over an arc of 270°. A pull of 500 pounds is found to be necessary to raise a load of 160 pounds. Determine the coefficient of friction between the strap and the pulley.

9. A hollow cylindrical tower of steel plate, having an external diameter of 3 ft. 6 ins., a thickness of $\frac{1}{2}$ inch and a height of 70 ft., carries a central load, including the weight of the tower, of 120,000 pounds and is subjected to a horizontal wind pressure of 80 pounds per foot of its height.

Calculate the vertical stresses at the fixed base of the tower on the windward and leeward side.

10. Prove that the angular twist θ on a shaft is given by

$$\theta = \frac{2T_m l}{\pi r^4 C}$$

A 3 inch shaft, 40 feet in length, is found to spring 6° when transmitting power at 150 revolutions per minute. Find the horse-power transmitted if the modulus of rigidity is 12,000,000 in pounds and inches.

11. Find the thickness of plates required for a boiler shell to work at a pressure of 200 pounds per square inch, the diameter of the shell being 5 ft. 6 ins.; the allowable stress on the plate may be taken as 12,000 pounds per square inch.

12. If a bar be subjected to a uniform tensional stress, show that the normal and tangential components of stress on a plane whose normal is inclined to the direction of the axis of stress, at an angle θ can be expressed in the form

$$p_n = p \cos^2 \theta$$
$$p_t = p \sin \theta \cos \theta$$

where p = tensional stress.

Hence show that in planes at right angles, the tangential stresses are equal and the sum of the normal stresses is a constant.

13. At a point within a strained solid, the stress in one plane is a tension of 120 pounds per square inch

with an obliquity of 30°, and on a second a compression of 80 pounds per square inch with an obliquity of 60°. Find (*a*) the angle between the two planes, (*b*) the plane upon which the stress is wholly a shear, (*c*) the planes of principal stress.

14. Show that in a continuous girder, having equal spans and loaded uniformly with w pounds per foot run, the relation between any three consecutive bending moments can be expressed in the form

$$2M_1 + 8M_2 + 2M_3 = -wl^2$$

A horizontal girder, having a total span of 100 ft., is fixed at the ends and rests upon a support at the middle point at the same level. Draw the curves of Bending Moment and Shear when (*a*) the load is distributed uniformly, (*b*) when, in addition to the distributed load, concentrated loads are placed at the middle points of each span each equal to one-sixth of the total distributed load.

FOURTH YEAR.

THEORY OF STRUCTURES, II.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 1.

PART I.

1. A station roof, with trusses 15 ft. apart, is supported by central columns, as shown in Fig. 1, and the weight of the roof and covering may be taken as 30 pounds per square foot of covered area. Determine the stresses in the various members of the truss, when in addition to the dead load there is a horizontal wind load of 30 pounds per square foot of projected vertical area.

2. Design the central cross section of a plate girder having an effective span of 50 ft. and a depth of 5 ft., 6 ins. centre to centre of the flanges, for Cooper's standard loading E^5 ; the dead load may be assumed to be 650 pounds per foot run of girder.

3. Design a central splice plate for the web of the plate girder in the previous question, taking into account the stresses due to direct shear and bending moment on the web.

4. Design a cross girder for a five panel through truss bridge, 120 feet long, for Cooper's standard loading E_{50} of the American Bridge Company's specification.

The span of the girder is 17 ft., 6 ins., back to back, of connection angles and there are two lines of stringers 8 ft., 0 ins. apart. The dead load of the stringers and floor system may be taken as 700 pounds per foot run of bridge and the estimated weight of the cross girder is 3,000 pounds.

5. A three pin arch, Fig. 2, of 160 feet span has a rise of 32 feet and is divided into 8 panels. The live load per foot run of truss is 3,000 pounds. Determine the stress in each truss when the span is fully loaded.

6. In the preceding example, determine, graphically, the line of resistance of the arch span for a live load covering $\frac{3}{4}$ of the span; also determine the horizontal thrust of the arch for the given system of loading.

PART II.—Afternoon, 2 to 6.

7. Determine the stresses in all the members of the roof truss, Fig. 3, due to a horizontal wind load of 30 pounds per square foot of projected vertical area.

The roof trusses are spaced 20 feet apart and the wind-ward side is supported on a roller end.

8. A draw span having equal arms of 100 feet length, divided into 4 equal panels, Fig. 4, is subjected to a live load of 2,600 pounds per lineal foot of truss. The dead load is 1,200 lbs. per lineal ft. of truss. Determine the stresses in the members (*a*) when the bridge is open, (*b*) when the live load covers one span.

Also find the stress in *X*, when the bridge is open.

9. An 8 panel bridge, of 200 ft. span and $39\frac{3}{4}$ ft. rise at the centre, Fig. 5, has two main trusses, 18 ft. apart. The dead load is estimated at 2,000 pounds and the live load at 4,700 pounds per foot run of bridge.

Determine the stresses in one of the trusses due to the dead load and the reversion stresses in the web members due to the live load.

10. Calculate the stresses in the lower lateral bracing in the bridge of the last question and the reversion stresses in the main lower chord for a wind load on the

upper chord of 200 pounds and on the lower chord of 480 pounds per foot run of bridge.

N.B.—The wind load is to be taken as a moving load.

11. Calculate the size of pin for the joint L_3 in the lower cord of a pin-connected bridge, when subjected to the stresses shown in the diagram, Fig. 6.

The extreme fibre stress in the pin is not to exceed 23,000 pounds per square inch.

12. Design the section of the top chord member of a bridge for a total dead, live and impact load of 620,000 pounds. The length of the member is 25 ft. and the inside width is 15 inches.

$$\left(\text{Use the column formula } p = \frac{17000}{1 + \frac{l^2}{11000\, p^2}}\right)$$

13. A cantilever span, Fig. 7, is loaded with 5,500 pounds per foot run of bridge. Determine the stresses in all the members and check the last panel by the method of moments.

FOURTH YEAR.

THEORY OF STRUCTURES, III.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 1.

N.B.—At least *two* examples in Part I and *three* in Part II must be attempted.

PART I.

1. Define the three principal moduli of elasticity and find expressions for the bulk modulus (D) and the rigidity modulus (C) in terms of Young's modulus (E).

Find the values of E, C and D from the following data:—A round bar, $\frac{1}{8}$ in. in diameter and 36 ins. between the supports, deflects .33 ins. under a load of 90 pounds in the middle and twists through an angle of 0.75° when subjected to a twisting moment of 1,000 inch pounds on a 10 in. length.

2. Explain what is meant by planes of conjugate stress and define conjugate stress.

Show that the ratio of two conjugate stresses may be expresed in the form

$$\frac{r}{s} = \frac{\cos\theta \pm \sqrt{\cos^2\theta - \cos^2\phi}}{\cos\theta \mp \sqrt{\cos^2\theta - \cos^2\phi}}$$

A wall, 8 ft. high, supports an embankment having a slope of 20°, the weight of the material being 120 pounds per cu. ft. and the angle of repose 25°.

Find the average intensity of the thrust on the wall, the total thrust, the horizontal component of thrust and the overturning moment.

3. Show that if a beam is initially curved to a radius R_o, the equations for the transverse strength can be written

$$\frac{p}{y} = \frac{M}{I} = E\left(\frac{1}{R} - \frac{1}{R_o}\right)$$

Also show that for a beam initially curved, the neutral axis does not pass through the centre of gravity, but lies at a distance z therefrom given by the equation

$$z - \frac{Z^2}{R_o} = \frac{nh^2}{R_o}$$

4. Prove that the hoop stress at any radius r in a thick cylinder having an internal radius of r^1 and an external radius r_2, is given by

$$q = \frac{p_1 r_1^2}{r_2^2 - r_1^2}\left(\frac{r_2^2}{r^2} + 1\right)$$

where p_1 = internal stress.

An hydraulic cylinder, having an internal diameter of 6 inches and a thickness of $3\frac{1}{2}$ inches, is subjected to an internal pressure of 2 tons per sq. inch. Draw a curve of hoop stress for this cylinder to scale.

5. Describe what is meant by an influence line.

Prove that for a system of loads passing over a bridge the maximum moment at any point is reached when the average unit load on the left of the point is equal to the average unit load on the whole span.

Also show that for a maximum shear in any panel of a bridge, the load on the panel must be equal to the load on the bridge divided by the number of panels.

PART II.

6. A flexible cable, weighing 1-10 lb. per lineal foot, is suspended between two poles A and B, 400 ft. apart, and hangs in a catenary having a modulus of 2000 ft. The poles are of the same height as the crown level.

A second cable, of the same weight, per lineal foot, is supported between B and a third pole C, of the same height, the angle ABC being 150°. If the horizontal pull of this cable is 1.155 times that on the first cable, find its dip and modulus and show that the intermediate pole should be supported by a stay in a plane at right angles to B and C. If the stay slopes at 45°, find the stresses to which it is subjected.

7. Show that the curve of a cable will be a parabola if it carries a platform loaded uniformly per horizontal unit of length.

An island divides a river into two channels. The river is crossed by a suspension bridge of two spans, the one of 216 ft., the other of 180 ft. The lowest points of the cable are in the same horizontal plane, 36 ft. below the summit of the pier erected on the island, 9 ft. below the top of the abutment at the end of the 180 ft. span and 4 ft. below the top of the abutment at the other end of the bridge. There are four cables and each cable is to carry a load of 1000 lbs. per lineal foot on the shorter span and of 2000 lbs. per lineal foot on the longer span. Find (a) the cable stresses at the pier and abutments, (b) the horizontal pull upon each cable, (c) the total length of the cable.

The pier is a measured prism of 12 ft. uniform width, 60 ft. high and weighing 125 ft. per cubic foot. Find the proper thickness for the pier at the top and at the bottom, taking 10,000 lbs. per square foot as a safe load and assuming that the deviation of the centre of pressure from the middle point of the base is not to exceed 4 ft.

8. Explain the object of the stiffening truss.

The platform in Ex. 7 is provided with a stiffening truss, the vertical suspenders being 12 ft. apart. If the dead load for the whole truss is 1,000 lbs. per lineal foot of truss and if *one-half* of each span is covered with an additional load of 1,000 lbs. per lineal foot of truss, find

(*a*) the stress in a suspender in each span, (*b*) the max. B. M. and S. F. on the truss in each span, (*c*) the total length of the suspenders, the suspenders at the centre being 12 ft. in length.

9. State the conditions of equilibrium in a masonry arch.

A masonry arch, of 48 ft. span and 17 ft. rise and having an intrados consisting of two plane faces, springs from abutments 6.2 ft. thick and with vertical faces. The outer thrusts of the abutments are produced to meet the extrados, which is horizontal; the depth of the key is 3 ft. and the specific weight of the masonry is 150 lbs. per cu. ft. The centre of resistance at the springing is at the middle point and one foot below the extrados at the crown. Find the resultant pressures at the crown and springing. Also find the maximum stresses of the vertical joint aligning with the inside of the abutment.

10. Explain the properties of a transformed catenary.

Determine the transformed catenary for an arch of $98\frac{7}{8}$ ft. span and 10 ft. rise, the depth of masonry for the crown being 15 ft. and weighing 120 ft. per cu. ft. Also find the direction and magnitude of the thrust at the springing.

11. Show that at any point of an arched rib, the B.M. is H. *DE*, *H* being the horizontal thrust on the rib, *DE* the vertical distance between the rib and the linear arch at the point in question.

A flat parabolic arched rib, of rise k and span $2\,l$ has both ends fixed and is loaded with a weight W at a point dividing the horizontal distance between the supports into two segments p and q. Show that the horizontal thrust on the rib

$$= \frac{15}{32}\ W\ \frac{p^2\,q^2}{k\,l^3}$$

and that the reactions at the supports are

$$\frac{W}{4}\ \frac{q^2\,(l+p)}{l^3} \quad \text{and} \quad \frac{W}{4}\ \frac{p^2\,(l+q)}{l^3}\ .$$

12. A flat parabolic arch rib, of 100 ft. span and 18 ft. rise, is fixed at the springing and carries a load of 4,000

lbs. concentrated 10 ft., measured horizontally, from the centre. Find the horizontal thrust on the rib and also find the axial thrust and shears at the point at which the load is concentrated. Determine the three points at which the B.M. is nil.

FOURTH YEAR.

HYDRAULICS, I.

TUESDAY, DECEMBER 17TH:—MORNING, 9 TO 1.

(*Eight questions may be attempted. The value of each question is attached.*)

1. Explain the meaning of each term of Bernouilli's equation

$$H = z + \frac{p}{w} + \frac{v^2}{2g}$$

and show that it is a necessary consequence of the law of conservation of energy.

At a given point X in a frictionless pipe, 80 feet above datum, the sectional area is .25 sq. feet and the pressure 2000 lbs. per sq. foot. The discharge is 2 cub. feet per second; find the total energy at the point per cub. foot of water. At a second point Y, 20 feet below the datum line, the pressure is 3000 pounds per sq. foot and the sectional area is .5 sq. foot. Find the loss of energy per cub. foot of water between the points X and Y. (40)

2. Define the coefficients of velocity, discharge, contraction and resistance.

In an orifice of 2 inches diameter the velocity of flow at the contracted section was found to be 28.5 feet per second under a head of 16 feet and the discharge .4177 cub. feet per second. Find the value of coefficients mentioned above where $g = 32.176$ feet $(\text{sec})^2$. (50)

3. Show that the loss of energy due to a sudden enlargement in a pipe is

$$\frac{(v_1 - v_2)^2}{2g}$$

and explain what assumption is made in your proof.

At a point 20 feet above datum, a line of piping sud-

denly increases in section 50 per cent. If the velocity of flow in the small pipe is 12 feet per second and the pressure is 40 pounds per sq. inch, find the pressure per square inch in the larger section at a point on the datum line. (50)

4. Prove that in a partially submerged rectangular orifice the discharge is given by the formula.

$$Q = CB\sqrt{2g}\left[\frac{2}{3}\left\{(H_3 + H)^{\frac{3}{2}} - (H_1 + H)^{\frac{3}{2}}\right\} + (H_2 - H_3)\sqrt{H_3 + H}\right]$$

where H_1 = the depth of the upper edge below the free surface.

H_2 = the depth of the lower edge below the free surface.

H_3 = depth of tail-race.

H = head due to velocity of approach. (60)

5. A dam, with a rectangular notch 8 feet wide, is formed across a channel and the depth of the water over the sill is 6 inches. Disregarding the velocity of approach, find the quantity of flow when the notch has (1) no side contraction, (2) one side contraction, (3) two side contractions. Coefficient of discharge = .625. (50)

6. Describe D'Arcy's experiments on the coefficient of friction of water in pipes and state concisely the chief results he obtained. (40)

7. Prove that the horse power (N) which can be delivered at the end of a pipe of diameter d and length (L), when the loss is n per cent., is given approximately by the formula

$$N = \frac{1}{28}\left(1 - \frac{n}{100}\right)\sqrt{\frac{nH^3d^5}{f\,L}} \quad (60)$$

8. Show that if two reservoirs having a difference of level Z be connected by a pipe of length L and diameter d,

$$Z = \frac{v^2}{2g}\left(1 + n + \frac{4\,f\,L}{d}\right)$$

where v = velocity of water in the pipe and n is a co-efficient depending on the form of pipe entrance.

The difference of level between the surfaces of two reservoirs connected by a 12 inch pipe, 2 miles in length, is 120 feet. Determine the discharge in cub. feet per minute, taking n as .5 and f = .01. (50)

9. Prove that the velocity of flow in open channels of uniform transverse section is given by the formula

$$v = \sqrt{\frac{2g}{f}} \sqrt{mi} = c\sqrt{mi} \qquad (50)$$

10. An aqueduct, with a section in the form of an isosceles right-angled triangle of height a, is laid with its base horizontal. Compare the quantities of water conveyed (a) when running full, (b) when the velocity is a maximum, (c) when the quantity conveyed is a maximum, and find the corresponding mean depths. (80)

11. A jet of water having a velocity v_1 impinges axially on a vane moving with a velocity u and having a turning angle β. Show that the work done by the water on the surface is

$$2\frac{wA}{g}u\left(v_1 - u\right)^2 \sin^2\frac{\beta}{2}$$

where A = sectional area of the jet.

Also determine the speed of maximum efficiency and the maximum efficiency. (70)

12. In a jet reaction wheel, deduce expressions for the useful work and the efficiency.

A reaction wheel, with 8 tubular passages each 3 square inches in area, passes 100,000 gallons of water per hour and makes 60 revols. per minute. The distance between the axis of revolution and the axis of an orifice is 2 ft. 6 ins. Determine the useful work and the efficiency. (80)

FOURTH YEAR.

HYDRAULICS, II.

MONDAY, APRIL 14TH:—MORNING, 9 TO 1.

(*Candidates may answer nine questions.*)

1. Find the discharge in gallons per hour through a

new cast iron 24 inch pipe, 1500 ft. long, when the surface of the water, in which the discharge takes place is 100 ft. below the reservoir water surface, (*a*) if the pipe is full open; (*b*) if the opening is contracted by a nozzle of $\frac{1}{4}$ the sectional area of the pipe.

2. Write a brief thesis, not exceeding two pages in length, on the variation of velocity of flow in a transverse section of an open channel.

3. In a length of LaRoche canal, in earth, the banks slope at 45°, the bottom width is .3 m., the depth of water is .5 m., and the slope is 1 in 500. Find the quantity of flow across a transverse section, c being 24.4.

4. Deduce an expression for the work done and pressure upon a surface of rotation driven by a jet of water in the direction of the axis of the jet.

If the surface is a paraboloid of $4\frac{1}{2}$ in. paramater, with a base of 6 inches diar. and if the jet delivers 1 cu. ft. per second and has a sectional area of 4 square inches, what amount of work is required to drive it against a jet with a velocity of 12 ft. per second. What will be the pressure on the surface?

5. In a Borda turbine deduce the relation

$$uv_1 \cos \gamma = gH_1$$

6. Deduce the useful work and efficiency, per cu. ft. of water, of a jet turbine working under a head of 100 ft. in which the blade angle at outlet is 30°. How will the result be modified if hydraulic resistance is taken into account by assuming $f_2 = f_4 = .1$.

7. Describe the Poncelet wheel and show how to determine its useful effect and efficiency.

8. Explain how to trace the actual path of a fluid particle in passing through a turbine.

9. State the general equations governing the design of a reaction turbine and thence deduce the equations for impulse turbines.

An inward-flow turbine has an external diameter of 3 ft. and an internal diameter of 2 ft. The whirling velocity at outlet is 18 ft. per second and the inlet velocity of whirl is 42 ft. per second and is equal to the

peripheral velocity at the same point. Find in tons per hour the quantity of water which must pass through the turbine to deliver 42 H.P.

10. A downward-flow impulse turbine works under a head of 100 ft. Assuming that the inlet velocity, the outlet relative velocity and the peripheral velocities are equal, find the lip angles at inlet and outlet, the direction at which the water enters the wheel, the depth of the wheel being 1.99 ft. If the turbine passes 2 cu. ft. of water per second, find its H. P., efficiency, and the inlet and outlet areas, which latter are equal.

11. In a centrifugal pump deduce the relation

$$2g\,H_s = u_2^2 - V_2^2 + 2\,v_s\,(v''_w - v_s) - v_d^2 - 2g\,h_r$$

and state the assumptions made.

12. Remark upon the angles α and γ in a centrifugal pump and discuss the particular points governing the design of the volute.

13. A centrifugal pump has an actual lift of 20½ ft. Its efficiency is .64, the outlet lip angle is Cot^{-1} 3.2, the velocity of flow (v_r) at outlet is 5.3 ft. per second. Find the peripheral speed of the turbine and the head lost in hydraulic resistance, the discharge pipe having a diameter of 28 ins. If the wheel has 6¾ in. blades and an outlet opening 9 ins. in depth, find the size of a pump which will deliver 40 cu. ft. per second.

FOURTH YEAR.

HYDRAULIC MACHINERY.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

(*Candidates may attempt seven questions only.*)

NOTE.—(The answers to the questions should be, as far as possible, illustrated by good sketches, for which a proportion of the marks will be awarded.)

1. Describe, by aid of a sketch, the construction of an hydraulic pipe joint suitable for a pipe conveying water at a pressure of 1,000 pounds per square inch.

Calculate the thickness of such a pipe when the in-

ternal diameter is 6 inches and the allowable stress is 3,000 pounds per square inch.

2. Describe the construction of an intensifier in which the ordinary pressure water from the town mains may be used to furnish water under a much higher pressure.

Calculate the size of the low pressure piston for an intensifier ram having a diameter of $5\frac{1}{4}$ inches, to supply water at a pressure of 2,000 pounds per square inch, using water from the high level reservoir on Mount Royal, which is estimated to give an effective head of 236 feet.

The friction of the machine is estimated to cause a loss of 3 per cent.

3. Describe the principle of action and the construction of an hydraulic brake, such as is used for bringing a train to rest in a station.

4. Show that an hydraulic pressure engine has a limited speed which can never rise above a value V given by

$$V = \sqrt{\frac{2g}{w} \cdot \frac{p_o}{\Sigma f}}$$

where p_o = pressure in the accumulator
w = weight of a unit volume of water
Σf = the sum of the coefficients of velocity referred to the velocity V
g = constant of gravity.

5. Describe the successive improvements in the simple reaction wheel, which have resulted in the modern form of turbine.

6. In some forms of turbine governors use is made of an epicyclic train to control the speed. Describe the arrangement and show how it is applied in any form of governor with which you are acquainted.

7. Describe the principal hydraulic features of a station for developing a natural fall of water and discuss the reasons which would influence you in the selection of turbines for (*a*) low falls, (*b*) high falls.

8. Describe the construction of a modern power station for supplying a city with water under high pres-

sure, applicable for working elevators, cranes, hydraulic presses and the like.

9. Describe one form of direct acting pump provided with means for adjusting the power developed in the steam cylinder, to the work done on the pump, and show what advantages these forms possess over pumps with a rotating shaft.

10. Distinguish between the various forms of automatic pump valves and explain what is meant by "valve head."

Show that in a gravity loaded valve, the valve head may be expressed by the formula

$$h = \left(p_2 - p_1 + f \frac{u^2}{2g} \right) \frac{\pi d^2}{4}$$

where p_1 pressure below the valve
p_2 pressure above the valve
u velocity of the water in the pipe.

11. Prove that the difference of head between the inlet and outlet surfaces of an horizontal turbine is given by

$$h = \frac{V_2^2 - V_1^2}{2g} + \frac{u_1^2 - u_2^2}{2g}$$

where u_1, u_2 are the velocities of the wheel and V_1, V are the relative velocities of the water at inlet and outlet respectively.

FOURTH YEAR.

HYDRAULIC LABORATORY.

TUESDAY, DECEMBER 17TH, 1901:—AFTERNOON, 2 TO 5.

(*All the questions may be attempted; the value is attached to each question.*

A proportion of marks will be given for good sketches.)

1. Describe by aid of sketches the apparatus used in the laboratory for determining the coefficients of discharge of weirs and describe what precautions are necessary to obtain accurate values.

In a test of a sharp-edged weir having a breadth of

18 inches, the following data were obtained:—

Total discharge = 1386 gallons
" time = 611.6 seconds

Vernier readings.

Time	I.	II.	III.
1	19'.126	19'.182	19'.216
3	19'.128	19'.183	19'.220
5	19'.131	19'.179	19'218
7	19'.130	19'.180	19'.217
9	10'.129	19'.181	19'.219
Zeros	21.252	21.295	21.344

Calculate the co-efficient of discharge, making allowance for end contractions. (70)

2. Describe the impact measuring apparatus used in the laboratory.

In an impact experiment with a bucket of parabolic section, the following data were obtained:

Orifice, $\frac{1}{2}$ square inch; head = 20 feet.
Coefficient of discharge = .6013
" velocity = .975
Balancing weight in pan = 4 lbs. 4 ozs.
Bucket:
Horizontal distance from orifice = 48 inches.
Vertical distance below " = 2.582 inches.
Turning angle of vane = 135°
Balance:—Horizontal arm = 24 inches.
Vertical arm = 36 inches.

Determine the force of impact and also the co-efficient of impact. (70)

3. Describe the arrangements used in testing the performance of small hydraulic motors in the laboratory.

In a test of the reaction turbine in the laboratory, the following data were obtained:

Total head on wheel = 33.12 feet
Total revolutions = 7884
Total quantity of water = 4112 gallons
Total time = 542 seconds
Load on brake = 17.5 pounds
Diameter of brake wheel — 180 inches.

Find the horsepower supplied, the horse-power developed at the brake wheel and the efficiency. (80)

4. Describe, by aid of sketches, the apparatus you would use in determining the coefficient of friction of a pipe.

In an experiment, the following data were obtained:

Time.	h	Heads.	h
1	7′.800		2′.812
2	7′.810		2′.813
3	7′.808		2′.806
4	7′.796		2′.810
5	7′.789		2′.809
Initial Readings	13.185		13.020

Pipe: Length = 72.4 inches.
Diameter = 0.3728 inches
Total discharge = 3892.5 cub. inches
Total time = 338.2 seconds

Calculate the coefficient of friction. (80)

5. What is meant by the critical velocity of water in a pipe? Show by what means it may be determined.

In a pipe of diameter 12.7 millimetres and having a length of 1.524 metres between the gauge holes, the following readings were obtained:

Loss of head h_1 h_2 metres of water.	Velocity metres per second.
′.001219	′.0346
′.002438	′.0646
′.004876	′.1262
′.008532	′.1937
′.009750	′.2260
′.01365	′.2583
′.02729	′.3484
′.08185	′.6530
′.1433	′.8780

Determine, by plotting upon the section paper provided, the critical velocity, the law of resistance (1) below the critical velocity, (2) above the critical velocity. (100)

STRUCTURAL ENGINEERING.

TUESDAY, APRIL 15TH:—AFTERNOON, 2 TO 5.

(Ten questions only to be answered.)

1. Give the methods by which steel is now manufac-

tured. State the grades of rolled steel, and give the purposes for which they are most commonly used.

2. Discuss the strength of riveted joints.

3. Why are lock angles to be recommended in roof truss details?

4. What uniformly distributed load can be carried on two $6'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ L. s. $7' - 0''$ long, placed back to back with the $6''$ legs vertical, and subject to a compressive stress of 30,000 lbs.?

Where $r = 1.94$, Area $= 6.84$ sq. ins., distance of centre of gravity to back of $3\frac{1}{2}''$ flange $= 2''$, and $f = 14.000 - 60\frac{l}{r}$ (l being in inches.)

(*a*) When angles are placed with $3\frac{1}{2}''$ legs up.

(*b*) When angles are placed with $3\frac{1}{2}''$ legs down.

5. Discuss the wind pressure to be allowed for mill buildings with masonry walls of various thicknesses, or with galvanized iron; and also the methods of wind bracing.

6. Define: voussoir, skewback, spandrel, line of resistance, and joint of rupture.

7. How may arches fail, and what influence does the position of the line of resistance have on the manner of failure?

8. What are the three usual methods of bonding brick arches? Describe.

9. How are arch centres set, so that they may be easily and safely removed? How long should the centre remain in position after the arch ring is laid?

10. What are the characteristics of blue shale? Would you use it for foundation courses below ground? —for a lintel?—for the capstone of a pier under a column? Give reasons.

11. What is the effect of fire on sandstone, limestone, granite, and marble. What are their fire-resisting qualities?

12. Define: header, course, quoin, coping, backing, and bushammering (tool and finish).

13. Describe the three classes of masonry according to Standard Specifications of Am. Soc. of C. E.

14. What constitutes English bond in brickwork? Sketch elevation only.

MECHANICAL ENGINEERING.

SECOND YEAR.

KINEMATICS OF MACHINES.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

Figures give proportional marks. Freehand sketches should be used wherever necessary to illustrate your answers. Eleven questions may be attempted.

1. What is meant by a Kinematic Chain? Define:—Plane Motion; Constrained Motion. (10)

2. Show that any relative motion of two bodies in a plane is equivalent to a series of instantaneous rotations about the virtual centre. (15)

3. A train starts from rest and has uniform acceleration. After travelling 1,000 yards its speed is 40 miles per hour. Draw diagrams of velocity (*a*) on a time base, (*b*) on a distance base, marking the scales on the diagrams. (20)

4. Define Simple Harmonic Motion. Two bodies, A. and B., have s. h. m. along the same line, of amplitudes 2 inches and 1 inch respectively. The phase of B.'s motion is 90° behind that of A. Explain how to draw a diagram giving the relative displacement of A. and B. at any given instant. (20)

5. Describe the quadric (cylindric) crank chain. Explain how to find the lengths of the links in this chain when used as the feathering mechanism in paddle-wheels. (15)

6. Show how to find either graphically or analytically the value of the angular velocity of the connecting rod in a direct acting steam engine. (15)

7. Describe the double-slider-crank chain. Enumerate its inversions. (10)

8. Show that in cycloidal wheel teeth, the common normal to the profiles at the point of contact passes through the pitch point. (20)

9. Describe two forms of approximate straight line motion, derived from the quadric crank chain. (10)

10. An epicyclic wheel train consists of a fixed wheel A. having 100 teeth, an idle wheel B. having 40 teeth, and a third wheel D., which is annular and has 80 teeth. Find the angular velocity of D. with regard to the arm which carries the axes of all three wheels. (15)

11. Sketch and describe an example of each of the two classes of ratchet mechanisms. Explain how the common pump may be regarded as a ratchet mechanism. (12)

12. Describe and sketch any two examples of the use of cam-trains in machines with which you are familiar. (12)

13. Define spheric motion. Give an example of a spheric mechanism. (10)

SECOND YEAR.

MECHANISMS.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. Make a sketch showing the various parts of any externally fired boiler.

2. Describe with the assistance of sketches the necessary parts of a single cylinder, horizontal, direct acting, steam engine.

3. Describe and sketch any form of quick return motion.

4. Two shafts are 3 ft. apart. Shaft No. 1 drives shaft No. 2 by means of gear wheels. Shaft No. 1 rotates at 300 r.p.m. Shaft No. 2 rotates at 100 r.p.m. Find the diameters of the pitch circles of the gear wheels.

5. Show by sketches two ways of fastening a pully to a round shaft.

6. How would you fasten an iron bolt to a block of masonry?

7. Show by sketches two ways of connecting the ends of two shafts together so that the motion of one may be

transmitted to the other. The axes of the shafts are in the same straight line.

8. Name three kinds of belting suitable for transmitting power and specify the conditions under which it is more advantageous to use one kind than another.

9. A belt running at a speed of 3,000 ft. per min. transmits forty horse power.

Find (*a*) The difference between the tensions on the tight and slack sides.

(*b*) The tension on the tight side assuming it to be twice the tension on the slack side.

(*c*) The width of the belt assuming that the safe tension per inch of width is 90 lbs.

SECOND YEAR.

MECHANICAL DRAWING.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 1.

The accompanying print shows a locomotive truck axle box.

The right hand view *A* is a half elevation and half section through centre of box.

You are required to draw two views as follows:

1. The left hand half of *B* in elevation and right hand half in section through centre of box.

2. A complete plan.

View *A* must not be drawn, but should be used as reference in making other views.

The views in prints are not necessarily to scale but dimensions are all correctly given by figures.

In *B* there are some lines incorrectly drawn; correct such mistakes in your drawing.

Finish both views in pencil, then ink in and dimension; no credit will be given for inking in unless both views are first completed in pencil.

Scale:—Half size.

THIRD YEAR.

MECHANICAL DRAWING.

WEDNESDAY, APRIL 16TH:—MORNING, 9 TO 1.

The accompanying print shows sketch of a longitudinal section through the centre of a condenser.

You are required to draw three views as follows:

1. A half elevation, and half longitudinal section through centre of condenser, as far as break at *MN*, the upper half being in elevation. The right hand end must not be drawn, but should be used as reference in making view No. 3.

2. An end view looking from left to right with cover removed.

3. A cross section on A. B.

In sketch there are certain lines left out, and others incorrectly drawn; correct all such mistakes. The sketch is not drawn to scale.

No credit will be given for inking in unless all three views are first completed in pencil.

Do not dimension your drawing.

Scale:—Full size.

THIRD YEAR.

MACHINE DESIGN.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

Note.—The figures after the questions show proportionate marks awarded.

All sketches to be made freehand.

1. A steam engine has a piston 10" dia. The maximum steam pressure is 200 lbs. per sq. inch (guage). Find the diameter of the piston rod. ($f_t = 3000$) of what material would you make the rod? (10)

2. It is desired to transmit 250 horse power by means of a round mild steel shaft rotating at 200 r. p. m. Find the diameter of the shaft to do this. ($f_s = 10{,}000$). (10)

3. A pulley weighing 600 lbs. is placed on the shaft as designed in question two, midway between bearings

ten feet apart. Find the stress in the metal when the shaft transmits the 250 horse power. (15)

4. Design a cast iron flange coupling for a 3″ mild steel shaft. Sketch and dimension. (20)

Note.—In the questions on riveted joints take:—

$d = 1.2\sqrt{t}$

$d_1 = 1.3\sqrt{t}$

$\frac{f_s}{f_t} = \frac{23}{28}$

$f_t = 11000$

where $d \equiv$ diameter of rivet.

$d_1 \equiv$ diameter of hole in plate.

$t \equiv$ thickness of plate.

5. Find the efficiency of a double riveted, double butt strap joint for a $\frac{3}{4}$″ plate. (10)

6. A steel Lancashire boiler, 7 ft. dia., is to work with a steam pressure of 150 lbs. per square inch (gauge). Design the longitudinal joint, assuming it to be a double riveted lap joint with an efficiency of 66 p.c. (15)

7. Make a sketch of the intersection of the longitudinal seam with the circumferential seam of the boiler of question six. Assume the circumferential joint to be a single riveted lap joint. (10)

8. Show that the thickness of the nut for a bolt $\frac{3}{4}$″ dia. should be approximately equal to the diameter of the bolt.

Take 10 threads per inch and $\frac{f_{tt}}{f_{tb}} = \frac{12}{9}$ (15)

9. Describe briefly the Whitworth and Sellers triangular screw thread, and state what, in your opinion, are the advantages of each. (10)

10. In screwing up an ordinary black nut about 90 p.c. of the work done on the spanner is required to overcome frictional resistances. Find (*a*) such a length of spanner handle for a bolt $\frac{3}{4}$″ dia., that the tensile stress in the bolt caused by screwing up the nut will be 6,000 lbs. per sq. inch; the tangential force applied at the end of the spanner handle being 50 lbs.

Find (*b*) the shearing stress in the bolt caused by screwing up the nut. (15)

11. Make a sketch of the following:—

(*a*) The cottered end of a foundation bolt.

(*b*) Two ways of fastening a pulley to a round shaft.

(*c*) Two pieces of metal fastened together by means of a tap bolt. Dimension proportional to the diameter of the bolt. (10)

THIRD YEAR.

THERMODYNAMICS.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

Note.—Civil, Electrical and Mining Engineering Students are to attempt only the questions in section A.

Mechanical Engineering Students may attempt only 6 questions of section A and 3 questions of section B.

The figures after the questions show proportionate marks awarded.

A.

1. Define isothermal expansion, adiabatic expansion, a perfect gas, total heat of steam, wet steam, superheated steam. (15)

2. An engine uses $1\frac{3}{4}$ lbs. coal per I. H. P. per hour, what is its duty? (15)

3. A steam engine takes steam during the whole stroke. The initial pressure is 100 lbs. per sq. in. abs., the exhaust pressure is 10 lbs. per sq. inch abs.

Assuming the cylinder to be non-conducting find (*a*) the work done per lb. steam, (*b*) the thermal efficiency and (*c*) the steam used per I. H. P. per hour. (25)

4. Air is compressed in a compressor. The relation of pressure to volume during compression is expressed by the formula $PV^{1.3} =$ Constant. The suction temperature is 70° F. and the pressure is 15 lbs. per sq. in. abs. The discharge pressure is 75 lbs. per sq. in. abs.

(*a*) Find the work done in compressing one lb. of air and discharging it into the mains.

(*b*) Find the temperature of the air after compression. (30)

5. Derive from first principles an expression showing the work done during expansion by a gas expanding (15)

6. How nearly may the steam engine approach reversibility? Does compression, as it ordinarily takes place, affect the thermal efficiency of the steam engine. (15)

7. The equation of adiabatic expansion of steam is

$$q = \frac{\tau}{L}\left(\frac{q_1 L_1}{\tau_1} + \log_e \frac{\tau_1}{\tau}\right)$$

Steam initially 95 per cent. dry expands adiabatically from a pressure of 100 lbs. per sq. in. abs. to a pressure of 10 lbs. per sq. inch abs. (*a*) Find the dryness at the end of expansion.

(*b*) If the steam be 95 per cent. wet initially find final dryness with same limits of pressure.

(*c*) Find the volume of the mixture at the end of expansion in each of the above cases. (25)

8. A steam engine uses steam expansively.
The diameter of the cylinder is . . . . . 12.5″
The stroke is . . . . . 12.0″
Cut off occurs at $\frac{1}{4}$ stroke.
The steam is initially dry and at a pressure of 100 lbs. per sq. in. abs.
The exhaust pressure is 10 lbs. per sq. in. abs.
Neglecting compression and assuming the cylinder to be non-conducting and that release occurs at the end of the stroke find the I. H. P. of the engine when running at 250 r. p. m.
The engine is double acting.
The relation of pressure to volume during expansion is expressed by the formula $PV^{1.135} =$ Constant. (30)

9. (*a*) Find the number of lbs. of steam used per I. H. P. per hour by the engine in question 8.
(*b*) Find the thermal efficiency of the engine. (25)

B.

1. A Peabody throttling calorimeter is attached to the main steam pipe of an engine.

The pressure in the steam pipe is 100 lbs. per sq. in. abs.

The pressure in the calorimeter is 20 lbs. per sq. in. abs.

The temperature in the calorimeter is 240° F.

Find the dryness of the steam in the steam pipe. (25)

2. Explain fully how to obtain the indicated horse power of a steam engine from the indicator diagram. (20)

3. During a trial on a steam engine the following readings were taken.

Initial counter reading	118
Final counter reading	7440
Initial load on scales	834 lbs.
Load on scales when running	320 "
Initial spring balance reading	17 "
Spring balance reading when running	61 "
Effective diar. of brake wheel	5.58 ft.
Steam used by the engine	1167 "
Duration of test	30 min.
The I. H. P. was found to be	65.9.

Find (*a*) The B. H. P.

(*b*) The steam used per I. H. P. per hour.

(*c*) The mechanical efficiency of the engine (25)

Saturated Steam Table.

Pressure per sq. in. abs.	Temperature Degrees Fahr.	Heat of the Liquid.	Total heat.	Specific Volume.
100	327.6	297.9	1181.9	4.403
20	227.9	196.9	1151.5	19.91
10	193.3	161.9	1140.9	38.16

THIRD YEAR.

DYNAMICS OF MACHINERY.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

Note.—The figures after the questions show the proportionate marks awarded.

1. A horizontal direct acting steam engine has the following dimensions:—

Cylinder diameter	12"
Stroke	12"

The connecting rod is 6 cranks long.

When the engine is rotating uniformly at 300 r. p. m. find (*a*) the velocity of the piston when the crank makes an angle of 60° with the horizontal.

(*b*) The accleration of the piston at the same instant. Prove any formulae you may employ. (20)

2. The maximum pressure of the steam used by the engine in question 1 is 100 lbs. per sq. inch (abs.). Find what proportion of the total force acting on the piston is required to accelerate the reciprocating parts at the ends of the stroke.

The weight of the reciprocating parts is 200 lbs.

The engine exhausts at atmospheric pressure. (15)

3. Given that the mean effective pressure acting on the piston of the steam engine of question 1 is 40 lbs. per sq. inch and that the fluctuation of energy is 10 per cent. of the energy of one revolution.

Find the weight of a fly wheel 6 ft. in diameter such that the fluctuations in speed may not exceed 3 per cent. (20)

4. A shaping machine has a Whitworth quick return motion. Find the relation between the velocity of the crank pin and the velocity of the tool. (20)

5. Power is transmitted by means of a nut and bolt. Find, proving any formulae you employ, the efficiency of the transmission neglecting the frictional loss caused by the force which keeps the bolt from turning and that caused by the reaction between the nut and the base plate.

Take the coefficient of friction = 0.25.

Take the diameter of the bolt = $\frac{3}{4}''$; 10 threads per inch. (20)

6. State the laws of friction derived from experiments on unlubricated, sliding bodies. Give a short description of Galton's experiments with any deductions that may be made from them. (10)

7. Derive a formula showing the relation between the pull on the tight side of a belt and the pull on the slack side. (15)

8. An iron pulley 36″ in diameter is rotating at 100

r. p. m. A leather belt passing over the pulley will just transmit 5 horse power. Find (*a*) the coefficient of friction between the belt and wheel (*b*) the width of the belt.

Safe stress per 1″ width of belt = 60 lbs.

Take the pull on the tight side of the belt equal to 3 times the pull on the slack side.

The arc of the pulley embraced by the belt is equal to one half the circumference. (20)

9. What is the function of the compensating cylinders on a high duty pump. Explain, using diagrams if necessary, how they accomplish the object for which they are designed. (10)

10. The work done by a steam engine is absorbed by a rope brake, water cooled. The initial load on the scales is 850 lbs. and that on the spring balance 20 lbs.

The wheel is 5 ft. 6″ dia. and the rope is $\frac{3}{4}$″ dia.

When the engine runs under steam at 250 r. p. m. the weighing machine balances at 300 lbs. and the spring balance reads 50 lbs. What brake horse power is the engine developing? (10)

FOURTH YEAR.

THERMODYNAMICS.

THURSDAY, APRIL 17TH:—MORNING, 9 TO 12.

(Eight questions may be attempted. Honour candidates must include Nos. 10 *and* 11. *Figures give proportional marks.)*

Tables of Logarithms may be used.

1. One pound of a perfect gas expands from a state (p_1v_1) to a state (p_2v_2) in such a fashion that pv^n = constant.

Explain exactly what transformations of energy occur. (15)

2. Explain why it is impossible to carry out in practice the Carnot cycle with steam and water as the working

substance in a heat engine, even assuming that adiabatic changes of pressure and volume can be made. (10)

3. Show that in a closed cycle of operations $\int \frac{dQ}{T} = 0$, the integration being performed around the whole cycle. (15)

4. Obtain an expression for the change in entropy per lb. of a perfect gas, for a given change in pressure and temperature, and hence explain how to draw lines of equal pressure on a temperature-entropy chart for such a gas. (15)

5. An ideal refrigerating machine, using carbon dioxide and its liquid as the working substance, has as its temperature-limits 0° and 40° Fah. Find the energy expended per lb. of ice produced (L for ice = 142 B. T. U.) having given that at 40° F. the entropy of 1 lb. CO_2 in the state of liquid and of saturated vapour is 0.06 and 0.26 units respectively. (15)

6. Describe the Linde process of producing liquid air. Would this process be possible if air were a perfect gas? Give reasons for your reply. (15)

7. Give a brief general account of cylinder condensation in the steam engine, describing the changes in dryness of the steam during a revolution, and indicating the probable causes of these changes. (15)

8. One pound of water at 100 lbs. per square inch abs. and 327.6° F. is completely evaporated and takes in 884 B.T.U. while changing its volume from 0.016 to 4.403 cu. ft. Find the rate at which temperature increases with pressure, for steam at 100 lbs., obtaining the formula you employ. (15)

9. In a gas engine having adiabatic expansion and compression and taking in and rejecting heat at constant volumes V_1 and V_2 find an expression for the thermal efficiency.

What would be the numerical value of this quantity if the engine worked with a mixture for which $\gamma = 1.36$, while the compression pressure is 100 lbs. per sq. inch absolute? (20)

10. Investigate an expression for the change of volume occurring during adiabatic expansion of a mixture of air and wet steam from temperature T_1 to temperature T_2. [T = absolute temperature]. (25)

11. In a certain gas it is found that

$K_v = 53.3 + 0.15T$ and

$K_p = 106.5 + 0.15T$.

The original temperature is 520° abs. and pressure one atmosphere.

Find the pressure at which this gas attains a temperature of 820° abs. during adiabatic compression, and obtain the formula you employ. ($\log_{10}\epsilon = 0.43429$). (25)

FOURTH YEAR.

(Course for Civil, Electrical and Mining Students).

Friday, Dec. 20th, 1901:—Afternoon, 2 to 5.

(Eight questions may be attempted).

1. Give some account of the points requiring attention when making an inspection of a steam-boiler with a view of ascertaining its condition.

2. Sketch and describe the arrangement of some type of small-tube water tube boiler.

3. A boiler burning 318 pounds of coal per hour evaporates 3,550 pounds of water per hour at 80 lbs per sq. inch by gauge, from a feed temperature of 83° Fah. If exhaust steam is used to heat the feed water to 140° Fah. and the efficiency and rate of evaporation of the boiler remain unaltered, find the saving in coal consumption.

Temperature of steam at 95 lbs. per sq. inch, abs. = 324° F.

Latent heat " " " " " " " =887 BTU.

4. What conditions are necessary for smokeless combustion in a boiler furnace? What difficulties arise in fulfilling these conditions in practice?

5. In a single cylinder non-condensing steam-engine

show how to estimate the probable power developed, if the size and type of engine, the working pressure, and the rate of expansion are given.

6. Give a brief account of the manner in which an indicator diagram reveals defects in steam distribution or valve setting. Illustrate your answer by sketches.

7. Having given the lap, lead, and travel of a slide valve, show how to determine the position of the eccentric on the shaft.

8. Discuss the advantages and disadvantages of valve gear of the Corliss type.

9. Make a diagrammatic sketch showing the various parts, and describe the working cycle of, the usual type of internal combustion engine.

10. What is meant by the efficiency of a gas producer? Under what conditions can a gas engine compete economically with a steam power plant?

11. Explain how it is possible, by the expenditure of a small amount of fuel in reheating, to obtain from an air motor a power as great as that employed in compressing the air.

FOURTH YEAR.

MACHINE DESIGN.

COURSE FOR ELECTRICAL ENGINEERING STUDENTS.

WEDNESDAY, DEC. 18TH, 1901:—AFTERNOON, 2 TO 5.

(Figures give proportional marks. Seven questions may be attempted).

1. Sketch and describe the construction of, either:

(*a*) A footstep bearing suitable for a long vertical shaft.

or

(*b*) A thrust bearing of the kind employed for the shaft of a marine engine. (10)

2. Sketch and dimension a double riveted double butt strap joint for a longitudinal seam in a boiler shell 8 feet diameter, working pressure 150 lbs. per sq. inch.

Take efficiency of joint as 70 p.c. (as a first approximation only) and allow stresses of 12,000 lbs. per sq. inch in tension, and 10,000 lbs. per sq. inch in shear.

3. A cast iron spur wheel with machine-cut teeth transmits 40 H. P. at a rim speed of 10 feet per second. The width of face is 6 inches. Determine the pitch of the teeth, showing how to obtain the formula you employ. (15)

4. In a rope drive the rope weighs 0.8 lbs. per foot. The tension being 290 lbs. on the tight side and 80 lbs. on the slack side, find approximately the sag in the two cases, supposing the shafts to be 50 feet apart. Obtain the formula you employ. (15)

5. Explain, with the aid of sketches, how to determine the form of the pitch surfaces of a pair of bevel wheels so as to have a given velocity ratio. Also show how to draw, and mark off on the wheel blanks, the profile of the teeth. (15)

6. The water pocket of a Yarrow water-tube boiler is of semi-circular cross section, diameter 14 inches. It is 9 feet long, and the working pressure is 250 lbs. per sq. inch. Find:—

(*a*) Thickness of metal of the semi-circular trough-shaped body.

(*b*) Thickness of flat tube plate.

(*c*) Number of $\frac{1}{8}''$ bolts required in making the joint between flange of pocket and tube plate. Area of one bolt at bottom of thread 0.418 sq. inch. Allowable stress 6,000 lbs. per sq. inch in tension. (15)

7. A worm-driven elevator is to lift 2 tons at 100 feet per minute. The rope barrel is 19 inches diameter, is secured to a worm wheel 24 inches diameter, and makes one revolution for 20 revolutions of the worm. Take efficiency of whole of gearing as 70 p. c. If the worm shaft is $1\frac{1}{2}$ inches diameter, find the stress in it (*a*) due to torsion (*b*) due to compression. (15).

8. In the above question show how to determine the resultant tensile or compressive stress in the worm shaft. (15)

9. The flywheel of a direct driven generator has a

radius of gyration of 9 feet, weighs 100,000 lbs. and runs at 94 revolutions per minute. The crank shaft is 22 inches diameter at the flywheel seat. Suppose an accident forcibly brings the shaft to rest from full speed in five revolutions, the retardation being uniform, find the stress on the shaft due to the inertia of the flywheel, acting along with a torque of 1,600,000 lbs. inches due to the engine, and a bending moment of 3,000,000 lbs. inches due to the weight of the flywheel and armature. (20)

FOURTH YEAR.

MACHINE DESIGN.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.

(*Figures give proportional marks. Seven questions may be attempted, in which Honour candidates must include Nos. 10 and 11.*)

1. Give some account of the considerations governing the strength of cylindrical furnace flues subjected to external pressure, and sketch two methods of stiffening such flues. (15)

2. In triple riveted, double butt-strap joints, it is found advantageous to omit every alternate rivet in the outer row. Explain exactly how this increases the "efficiency" of the joint. (15)

3. Investigate an expression for the load in pounds required to compress a helical steel spring one inch, the wire being of circular section. Take $C = 11$ million (lbs. and inches). (15)

4. In a bicycle the horizontal distance from centre to centre of pedals is 9 inches, the distance between the cranks is $4\frac{1}{2}$ inches, and the crank axle bearing is 3 inches long. The throw of the crank is 7 inches. Find the diameter of the pedal pin, that of the crank (which is of circular cross section), and that of the crank axle, allowing a working stress of 20,000 lbs. per square inch, with a maximum pressure of 100 pounds on each pedal at the centre. (20)

5. Find the speed at which the maximum power can

be transmitted by a manilla rope whose weight is $.314d^2$ lbs., per foot and whose greatest permissible load is $200d^2$ lbs., where d is the diameter of the rope in inches. Take $\frac{T_1}{T_2} = 4$, and neglect the effect of bending on the strength of the rope. (20)

6. The rectangular slide bar of an air compressor is 26″ long between supports, and 8″ wide. Find its thickness, if of cast iron supposing the maximum load on the piston rod is 7 times the length of the crank. Working stress, 2000 lbs. per square inch. (15)

7. Sketch some one form of adjustable connecting rod big end, pointing out the advantages of the design. (15)

8. Sketch and describe a method of relieving a flat slide valve from steam pressure. (15)

9. Explain how to draw a Zeuner valve diagram for an expansion valve sliding on the back of the main valve; prove the construction you employ. (20)

10. The ram of a slotting machine is balanced by a weight of 150 lbs. at the end of a wrought steel lever 2 feet long, which oscillates in a vertical plane through an angle of 60°. If the motion of the weight is approximately simple harmonic, and a downward swing is completed in $\frac{3}{4}$ second, find the section of the lever at the axis, neglecting weight of lever itself. (20)

11. In a flywheel with radial arms, explain the nature of the strains caused during rotation.

Having given the formula for the total tensional stress in the rim at any point

$$T = \frac{G}{g} A v^2 - \frac{F}{2} \frac{\cos(a-\phi)}{\sin a}$$

show that

$$F = \frac{1}{3} \frac{G}{g} v^2 \frac{3 - \frac{(r_1-r_2)^2}{R_2} \frac{r_1 + \frac{1}{2} r_2}{R}}{\frac{r_1-r_2}{A_1 R} + \frac{1}{2 A a}}$$

where F. is the radal pull exerted by the rim on each arm. (25)

FOURTH YEAR.

MACHINE DESIGN, II.

MONDAY, APRIL 7TH:— MORNING, 9 TO 1.30.

The accompanying is an unfinished drawing of a pneumatic riveter. The working air pressure is 80 lbs. per sq. in. The over reach is 36″.

1. Find a suitable section at *AA* for the hollow steel stake, sketch and dimension.

2. Find a suitable section at *FF* for the hollow steel stake, sketch and dimension.

3. Find a suitable section at *BB*, sketch and dimension.

4. Design, sketch and fully dimension the die D. Size of rivet for die = $\frac{3}{4}$″ dia.

5. Sketch and fully dimension the piston rod. (*Note P* shows a section of piston rod).

6. Find a section suitable for the lever at *CC*. Sketch and dimension.

7. Sketch and dimension the pin *E*.

8. Determine the number and diameter of the bolts fastening on the cylinder head *H*.

All sketches are to be made in pencil.

FOURTH YEAR.

DYNAMICS OF MACHINERY.

WEDNESDAY, APRIL 16TH:— MORNING, 9 TO 12.

Note.—Only *nine* questions are to be attempted. The figures after the questions show proportionate marks awarded.

1. How would you proceed to balance a horizontal, compound steam engine with cranks at right angles? (35)

2. A horizontal, single cylinder steam engine has a 12″ stroke. The connecting rod is 6 cranks long.

The piston and rod weigh 53 lbs.
The connecting rod weighs 103.5 lbs.

The crosshead weighs 63.5 lbs.

The engine runs at a uniform rate of 300 r. p. m. What weights would you use for balancing? (20)

3. Discuss briefly the theory of journal friction and in the case of a perfectly fitted bearing find the work lost in friction in one revolution of the journal. (25)

4. Make a sketch of and describe the Siemens epicyclic-train dynamometer. Show how it may be used as a transmission dynamometer. (15)

5. A heavy wheel rotating 180 times a minute is brought to rest in 40 secs. by a uniform tangential frictional force of 12 lbs. applied at a distance of 15″ from the axis. How long would it take to be brought to rest by the same friction if two small masses each weighing 1 lb. had been attached at opposite sides of the axis at a distance of two feet from it? (20)

6. Find the velocity of a bullet fired into a ballastic pendulum from the following data:

The moment of inertia of the pendulum is 200 lb. foot^2 units, and it weighs 20 lbs. The distance from the axis of its centre of gravity is 3 ft. and of the horizontal line of fire is 3 $\frac{1}{8}$ feet. The bullet penetrates as far as the plane containing the axis and centre of mass and weighs 2 oz. The cosine of the observed angle of swing is $\frac{1}{8}$ brought to rest in 40 secs. by a uniform tangential fric- (30)

7. A torpedo boat with propeller making 270, r. p. m. made a complete turn in 84 secs. The moment of inertia of the propeller was found experimentally to be 1 ton-foot^2. Find the precessional torque on the propeller shaft. (25)

8. Explain a method of finding the radius of gyration of a rigid body such as a connecting rod. (20)

9. A wrought iron bar 2 ft. long of uniform section $1\frac{1}{2}'' \times 1''$ swings about an axle fixed at one of its ends. The other end is attached (as in the Robb engine) to the crosshead of a high speed engine for purposes of indicating. Find the maximum force on the fixed axle when the engine is making 300 r. p. m.

Stroke of engine is 12″. (25)

10. What is meant by a sensitive governor, a static governor, a loaded governor, an isochronous governor?

What influence does friction have on the action of a pendulum governor? (25)

11. A vertical single-acting, single cylinder suction pump has the following dimensions:

Stroke = 9″.
Diameter of plunger = 4″.
Suction head = 10 ft.
Connecting rod is 8 cranks long.
Dia. of suction pipe = 3″.
Clearance (fraction of piston displacement) = 1.33.
Length of suction pipe = 10 ft. No air vessel.

Find the maximum number of revolutions per min. this pump will run at with the suction column remaining continuous. (30)

12. Investigate a graphic method of determining the forces acting on a Marshall's value gear. (25)

FOURTH YEAR.

MECHANICAL ENGINEERING.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

(*Ten questions may be attempted.*)

1. Describe, and give the approximate results of some experiments on either (*a*) the transmission of heat through boiler plates or (*b*) the change in temperature in flue gases as they pass through boiler tubes.

2. Give some account of the precautions to be taken to avoid corrosion when boilers are out of use for a considerable period.

3. What provision is made for cleaning, examination, and removal of mud in the design of either (*a*) a Babcock and Wilcox or (*b*) a locomotive boiler.

4. Discuss briefly the advantages and disadvantages of the use of superheated steam in steam engines.

5. Find the sizes of cylinders for a quadruple expansion engine to indicate 5,000 H.P. at 80 revolutions per minute. The piston speed is not to exceed 700 ft. per

minute, the cut off in the H. P. cylinder is to be 0.6, and the total rate of expansion is to be 15. The Referred Mean Pressure will be 40 lbs. per square inch.

6. Give a short explanation of the action of the various parts of the Westinghouse Air Brake during a "service application."

7. Show that in a non-compound locomotive the tractive force at low speed is given approximately by the formula

$$T = 100\, d^2 \frac{L}{D}$$

where d = diam. of cylinders in inches
L = stroke in feet
D = diam. of driving wheel in feet.

Assume a working pressure of 175 lbs. per sq. inch by gauge, a diagram factor of 0.8 and a cut off of 0.75. (Log_e 1.33 = 0.234).

8. Give some account of the various factors which make up train-resistance.

9. Describe some method of "scavenging" in a gas engine. Why is "scavenging" desirable?

10. Show that under ideal conditions the efficiency of a screw propeller would be

$$\frac{2\,(1 - s)}{2 - s}$$

where s is the slip. What is found to be the relation between slip and efficiency in practice?

11. Explain how to determine the skin resistance of a ship.

12. An air compressor drawing in 2,000 cubic feet of free air per minute and compressing to 100 lbs per sq. inch by gauge, has a thermal efficiency of 75 per cent. Find the power required to drive this compressor (*a*) at the standard barometric pressure and (*b*) when set to work at an altitude of 6,000 ft. where the average barometric pressure is only 24 inches, the temperature being the same in the two cases.

One cubic ft. of air at 14.7 lbs. and 60° F = .076 lb.
Log_e 7.8 = 2.054 Log_e 9.5 = 2.249.

FOURTH YEAR.

MECHANICAL ENGINEERING; LABORATORY WORK.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 12.

(Figures give proportional marks. Seven questions may be attempted.)

1. If called upon to carry out a series of experiments upon the efficiency of a worm and worm wheel, describe how you would arrange the apparatus, state what measurements you would make, and explain how the experiments would be conducted. (10)

2. Explain how to measure experimentally the power and sensitiveness of a loaded Watt governor. (10)

3. In verifying the balance of a Froude brake after the manner of Osborne Reynolds, show clearly how it is possible to estimate and allow for the loss of heat by radiation and conduction. In such an experiment how would you avoid error due to the inaccuracy of the mercurial thermometers employed? (15)

4. Make a heat balance sheet for a boiler trial in which the following figures were obtained:—

Mean steam pressure 96.2 lbs. per sq. inch abs.
Mean temperature of feed water 79.2 deg. Fah.
Coal fired per hour 425 lbs.
Percentage of moisture in do. 1.5
Percentage of CO_2 in dry furnace gases, 13.5 by weight.
Percentage of carbon in coal as fired 82 by weight.
Mean temperature of flue gases leaving boiler 710 deg. Fah.
Mean temperature of air entering furnace 100 deg. Fah.
Mean specific heat of flue gases 0.238 B. T. U. per lb.
Dryness of steam at stop valve 97 per cent.
Coal per hour necessary to maintain steam pressure during radiation experiment 24.1 lbs.
Water evaporated per hour 3,228 lbs.
Calorific value of coal per lb. as fired, 14,600 B. T. U.
Latent heat of steam at 96.2 lbs. abs. 886
Heat of liquid at 96.2 lbs. abs. 295

Heat of liquid at 79.2 deg. F. 47.5
Equivalent weight of carbon = 12, of oxygen = 16. (25)

5. Explain how to calculate the temperature of the charge in a gas engine cylinder at various points during the working stroke. How is the exhaust loss determined in a gas engine trial? (20)

6. From the following figures find an approximate expression for the power wasted in internal friction in the Mackintosh Seymour engine when running at constant speed. The lost power is not directly proportional to the total indicated power; state what you think is the reason for this. (20)

I.H.P.	B.H.P.
4.72	Nil
45.5	39.5
66.7	59.7
98.5	90.0

7. Describe the Laboratory method of testing indicator springs, stating carefully the sources of error in such tests, and the means of avoiding or allowing for such errors. How would you test an indicator and its gear for the following errors:—

(*a*) Error due to inaccuracy of reducing motion on engine.

(*b*) Error due to stretch of indicator cord. (15)

8. An engine indicating 116 H. P. uses 1,544 lbs. of steam per hour (dryness 0.98) in the cylinders and 248 lbs. in the jackets. The steam pipe pressure was 172 lbs. per sq. inch absolute, and the exhaust pipe pressure was 5 lbs. per sq. inch abs. Supposing the jacket water to be returned to the boiler without cooling, find the B. T. U. expended per I. H. P. per minute, having given

Pressure	L	h	
172	853.1	341.5	
5	1000.8	130.7	(15)

9. Sketch the form of indicator diagram obtained from a good air compressor, explaining how the diagram shows the work wasted from various causes.

A single stage compressor working at 100 lbs. air

pressure by gauge has a double acting air cylinder 10″ dia. × 12″ stroke, and indicates 35 H.P. at 160 revolutions per minute. Its volumetric efficiency is 0.9. Neglecting the volume of the piston rod compare the performance of this compressor with that of an ideal machine having isothermal compression and delivering the same weight of air. Temperature of air in compressor at beginning of compression stroke 70° F. Barometric pressure 14.4 lbs. per sq. inch. One pound of air at 60° and 14.7 lbs. occupies 13.1 cu. ft.

$\text{Log}_e\ 7.95 = 2.073.$ (20)

MINING AND METALLURGICAL ENGINEERING.

THIRD YEAR.

METALLURGY.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 12.

1. Make a diagram showing the several operations of the old Welsh method of smelting copper ores in reverberatory furnaces, and explain with the aid of equations the chief reactions that occur.

2. Explain as fully as you are able how the silver and copper occurring in small quantities in burnt pyrite can be obtained by a process involving their solution in a suitable aqueous solvent.

3. Sketch and describe a blast furnace for smelting iron ores, naming the different parts.

4. Explain with the aid of equations the chief reactions that occur in the blast furnace.

5. Enumerate the various substances that are charged in at the top of a blast furnace, explaining the uses of each.

6. Why is slag produced in the blast furnace, of what does it consist, and how may it be utilized after leaving the furnace?

7. Sketch a Bessemer converter, and explain the manufacture of Bessemer steel. What part does the lining of the converter play in the process, and how does this limit the kind of pig iron that can be employed?

8. What are the essential differences in composition and properties between wrought iron, tool steel, grey pig iron and white pig iron?

THIRD YEAR.

ORE DRESSING.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.30.

(*Figures in parenthesis show percentage value of each question.*)

1. What is Ore Dressing and why is it necessary to dress ores? (6)

2. What is usually the first step in ore dressing, and under what conditions is it unnecessary? (6)

3. What are the characteristics which are of most importance in separating mixtures of minerals? Name them so far as possible in the order of their importance. (6)

4. What is the usual expression for the rate of uniform free fall of a spherical grain in water, and how is this obtained? (10)

5. How is this theoretical sphere fall formula affected by the character of the mineral and the conditions of practical work. (10)

6. Describe the experimental determination of the rate of fall of different grains; and show how this can be used to determine the coefficients in the theoretical formula. (10)

7. Describe some standard form or rising current classifier. (6)

8. What is the relative power consumption in crushing to different degrees of fineness, and why does this rule fail when the crusher is crowded beyond its proper capacity? (6)

9. Describe a well known form of jaw crusher, and explain the effect of changing the point of support of the movable jaw. (6)

10. Describe some good form of fine crusher, and name several other machines which might be used for the same service. (6)

11. Describe a jig and explain its use, first when arranged to make no "hutch" or through product, and then when arranged to make both fine and coarse concentrates and a waste product. (10)

12. What bearing has the so-called Rittinger or Spheres formula on jigging? (4)

13. Wherein does the action of a jig differ from that of a classifier? (4)

14. Wherein does the action of a jig differ from that of a pan? (4)

15. Explain how a complex separation can be made by means of a multiple compartment jig. (6)

FOURTH YEAR.

METALLURGY OF IRON AND STEEL.

TUESDAY, APRIL 15TH:—MORNING, 9 TO 1.

1. What form of electrical pyrometer would you consider most suitable for producing a continuous record of the temperature of the hot blast supplied to an iron blast furnace. Give reasons for your choice. Make sketches of the pyrometer, showing its position in the hot blast main, and of the recording appliance.

How would you calibrate the instrument, and how could a single recording apparatus be employed to obtain practically continuous records from several furnaces?

2. Describe with the aid of a sketch the construction and use of the Mahler calorimeter.

Calculate the calorific power of a coal from the following figures.

Weight of iron wire used = 0.0071 grams
Weight of water in calorimeter = 2005 grams
Water equivalent of calorimeter = 470 grams
Weight of coal used = 0.903 grams
Heat of combustion of 1 gram of iron = 1.6 Calories

Neglect the heat produced by formation of acids.

Record of calorimeter temperatures.

Minutes.	Degrees.	Minutes.	Degrees.	Minutes.	Degrees.
0	14.445	4½	15.80	7	17.26
1	.45	5	16.92	7½	.255
2	.455	5½	17.18	8	.25
3	.46	6	17.25	9	.245
4 *	.465	6½	17.255	10	.24

*The charge was fired at this moment.

3. What constituents has the microscope shown to be present in steel; of what does each consist, and how are they probably formed?

What are "combined carbon" and "graphite" in steel, and how can their amount be determined by chemical analysis?

4. State what you know about the constitution of

alloys. How has such information been obtained experimentally?

Describe in detail the constitution of any one set of binary alloys.

5. Give a dimensioned sketch of a modern blast furnace, and describe the method of charging the ore and fuel into the furnace, and of enabling the walls to resist the scouring action of the slag.

6. What effects have manganese and silicon respectively on the properties of cast iron, and what conditions in the blast furnace would lead to the production of a siliceous pig iron?

7. What is the difference between the acid and basic methods of producing steel in an open hearth furnace?

Describe with sketches the construction of the Wellman tilting furnace.

8. Why is ferro-manganese added in the manufacture of open hearth steel? What effects have sulphur and phosphorus respectively on the quality of iron and steel?

FOURTH YEAR.

ELECTRO-METALLURGY.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Describe with sketches the arrangement of a plant for the electrolytic refining of copper. Mention a suitable current density and composition of the electrolyte. What operations are necessary in order to maintain the electrolyte in a satisfactory condition?

2. Describe the Moebius process for the electrolytic parting of doré silver. Sketch the bath used for this purpose. How does the presence of copper affect the process?

3. Describe a process for the electrolytic production of aluminium, and sketch a furnace suitable for the purpose.

4. What are the conditions necessary for the production of coherent deposits of zinc from aqueous solutions?

Describe some successful process in the electro-metallurgy of zinc ores.

5. Describe with the aid of sketches the method of manufacture of carborundum or calcium carbide. Mention some uses of the one you select.

6. In what way can electrolysis be applied in the metallurgy of gold. Describe in detail some process in which it has been successfully used.

7. Write a short essay on the probable sphere of electro-metallurgy; under what conditions is it likely to compete successfully with other methods?

8. Give a short account of some methods of electric welding or heating of iron.

FOURTH YEAR.

ADVANCED METALLURGY.

MONDAY, APRIL 14TH:—MORNING, 9 TO 1.

1. Describe the hyposulphite lixiviation process for the extraction of silver from it's ores: under what circumstances would you recommend it's use.

2. Sketch a reverberatory furnace as used for smelting lead ores, and describe the method of obtaining lead by it's aid. For what class of ore is it suited?

3. Describe in outline the production of gold, silver, and lead by blast furnace methods from a sulphide ore containing these metals.

4. What are the chief processes in use for desilverizing lead? What are their relative advantages? Describe in detail the Pattinson process.

5. Give a short account of the roasting of lead ores, stating the objects of roasting such ores and the kinds of furnace found most suitable, together with the special difficulties to be encountered in the operation.

6. Make a dimensioned sketch of a modern water-jacketed lead blast furnace, and describe the blowing-in operation.

7. What are the general conditions to be observed in

making up the charges for a lead blast furnace? Give some idea of the composition of a suitable slag.

8. Discuss briefly the position of the metallurgy of zinc.

Sketch and describe a Belgian furnace for treating zinc ores, and give an outline of the process of obtaining spelter from blende.

9. Describe in outline a method of obtaining the copper and the nickel from the pyrrhotite ores of Sudbury.

10. What are the main difficulties encountered in recovering tin from it's ores, and how are they overcome? Give an outline of the method of smelting tin ores in reverberatory furnaces. How is crude tin refined?

FOURTH YEAR.

MINING.

TUESDAY, APRIL 8TH:—MORNING, 9 TO 1.

(*Figures in* ( ) *show percentage value of each question.*)

1. How would you prospect and, so far as possible, prove a tract of 100 acres of gold bearing gravel averaging 100 feet in depth with bed rock 20 feet below water level?

2. Describe a typical case either of gold dredging or hydraulic mining, and state the conditions under which such work is likely to be remunerative and the probable cost of operating per cubic yard. (10)

3. Describe concisely one complete round with a column rock drill in a raise, from the beginning of work after a blast to the next shot firing: and state the approximate amount of rock that can be got down per day, per machine in sinking, drifting and stoping moderately hard rock. (7½)

4. Describe concisely some method of deep drilling by means of which cores or samples of rock can be brought to the surface, and state how the exact location and orientation of these cores is accomplished. (10)

5. Compare longwall and pillar and stall methods of coal mining, and state the salient features of each system and the conditions under which each is used. (10)

6. Describe concisely the method of stoping a soft ore body about 15 feet thick where timber is reasonably plenty and caving methods are not applicable. (10)

7. Describe some approved method of working a large body of ore by a method involving caving. (10)

8. State and discuss briefly the more common causes of explosions in coal mines. (10)

9. What are the characteristics of good hoisting rope, how is such rope cared for in installation and service, and what features of the design of hoisting gear and engine are affected by the size and kind of rope used? (10)

10. Describe concisely the operation of sinking a shaft 7 × 12 feet 300 feet in depth. Assume 30 feet of drift, 30 feet of weathered rock and 240 feet of moderately hard sandstone and slate.

Specify the equipment for sinking, state its approximate cost, state the force of men required to do the work, and estimate the approximate cost and rate of sinking, exclusive of interest on plant. (15)

FOURTH YEAR.

MINING MACHINERY.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 1.

*(*Figures in ( ) show percentage value of each question.*)

A. Assume a quartz vein 6 feet thick, dipping 80° and proved clear across a claim 700 feet wide with vertical boundaries. Development work has been done to 500 feet and stoping to 300, and work on the adjoining claims shows that the vein keeps its size and value to great depths.

The ore is a hard quartz carrying ¼ oz. of free gold and 1 p.c. of high grade concentrates.

In its present condition the mine makes 700 gallons of water a minute.

At a distance of 3 miles from the mine, and 400 feet lower is a stamp mill situated on a small river.

About 600 yards below the mill there is a fall in the river with a head of 80 feet. The minimum flow available is 30 cubic feet per second in dry seasons; but there is double this supply for at least 8 months in the year.

The country is well wooded and moderately rough, and the distance to rail is 20 miles over roads that can be used for teaming.

1. What machinery should the mine have to ensure an output of 150 tons per day for several years, and how much power would each machine require. (10)

2. What method of transportation should be used to convey the ore to the mill and how much power would it require? (10)

3. What machinery should the mill have and how much power would each machine require? (10)

4. What power plant should be used at the falls and what system of transmission and utilization at mine and mill? (10)

5. What should be the size, number and character of the wires, pipes, or ropes used in transmitting this power to mine and mill and what would be the loss in transmission? (10)

6. Would the water power be sufficient to run both mine and mill, and if not, what other power plant should be built and what would be its location and capacity? (10)

7. Assuming (in this case only) that the mine had some other source of power. What transmission system should be used from fall to mill, and how would its efficiency compare with that outlined above? (10)

B. Assume a coal mine having a downcast shaft 10 × 12 feet, 800 feet deep and an upcast shaft 8 x 14 feet, 850 feet deep and between them air courses which if in series would be equivalent to a single passageway 6 × 10 feet 15,000 feet long.

8. What horse power would be required to send 30,000 cubic feet of air per minute through the mine, and what would be the pressure or W. G. at the fan? (10)

9. What would be the horse power necessary to give the same ventilation provided the airways could be arranged in three equal splits separating at the bottom of the shafts, the downcast and upcast remaining as before? (10)

C. 10. Describe and sketch a Rittinger differential pump and show why it is more efficient than common pumps. (10)

FOURTH YEAR.

MILLING AND ORE DRESSING.

SATURDAY, APRIL 12TH:—MORNING, 9 TO 12.30.

(Figures in ( ) show percentage value of each question.)

1. Of what materials are stamp mill shoes and dies made, and how do the different makes compare in cost, durability, etc.?

What is drop, what are the maximum and minimum limits in use, and why is each preferred in the localities where it is used? (10)

2. Name and locate the different plates used with a stamp battery. State how they are "dressed" and "cleaned up," and give the approximate character and proportion of gold caught on each in any given case. (10)

3. What is a sectional cam and what are its advantages and disadvantages? How are shoes and tappits fastened to the stems, and where and why do stems break? (10)

4. Describe pan amalgamation, give the reactions which take place, and state the conditions under which this method of milling is now used. (10)

5. Name the methods commonly employed for recovering the "values" which escape amalgamation, and describe a tailings treatment plant which concentrates by means of ore dressing methods. Standard machines need not be described, but their arrangement, relations, etc., must be made clear, and the output and percentage loss in final tails should be stated. (10)

6. State the general conditions under which chlorina-

tion is preferred to cyaniding; give an outline of the two best methods of chlorination and state which is most used in North America. (10)

7. Describe a process for treating stamp mill tailings by the cyanide process, and give the reactions, average percentage of recovery and approximate costs of treatment, exclusive of crushing and milling. (10)

8. Describe some laboratory operation in which you have made separations on some form of table. Standard ore dressing apparatus need not be described, but its adjustments and its comparative fitness for its use should be carefully considered. (15)

9. Describe and similarly discuss some other important piece of your laboratory work not involving the use of slime tables. (15)

FIRST YEAR.

DESCRIPTIVE GEOMETRY.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. A right square prism 3 in. long, edge of end $1\frac{3}{8}$ in. stands on the H.P. on one end. The face nearest the V.P. is at 20° to the V.P. A right circular cylinder 3 in. long, diam. $1\frac{5}{8}$ in., has its axis parallel to the V.P. and bisecting that of the prism. The axis of the cylinder is at 20° to the H.P. Show the penetration lines.

2. A tetrahedron $2\frac{1}{2}$ in. edge has three of its corners *A*, *B* and *C* placed so that *A* is 1 in. in front of V.P. and $\frac{1}{2}$ in. above H.P.

B is $\frac{1}{2}$ in. in front of V.P. and $1\frac{3}{4}$ in. above N.P.

C is 2 in. in front of V.P., and is above the H.P.

Show the plan and elevation of the tetrahedron.

3. A hexagonal pyramid, $1\frac{1}{4}$ in. edge of base, 3 in. axis, has a triangular face in the V.P. and its axis is at 50° to the H.P. Show plan and elevation. Also show the true form of section by a vertical plane at 70° to the V.P. and containing the point farthest from the V.P. (two solutions).

4. Two straight lines 3 in. long are at right angles to each other. One is horizontal and the other is at 50° to the H.P. and 25° to the V.P. Show plan and elevation.

5. Shew a screw thread on a bolt for one complete turn. The outside diam. of bolt is 3 in., pitch of screw 1 in., and section of thread an equilateral triangle.

6. A right circular cone 2 in. diam. of base, 3 in. axis, rests on the H.P. on a point $2\frac{1}{2}$ in. in front of the V.P. The plan of the axis is at 45° to XY. The axis is inclined to the V.P. at 15°. Show plan and elevation.

7. A pentagonal prism $1\frac{1}{4}$ in. edge of end, 3 in. long, has its axis horizontal and at 30° to the V.P. It has a rectangular face inclined to the H.P. at 20°. A section plane perpendicular to the V.P. passes through the end of the axis and is at 30° to the H.P. Show the true form of the section.

SECOND YEAR.

DESCRIPTIVE GEOMETRY.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. The V.T. and H.T. of a plane make angles 75° and 30° respectively with the XY. Find the traces of a plane parallel to it and whose perpendicular distance from it is one inch.

2. A right circular cone with angle of 60° is cut by a plane which passes through the axis $1\frac{1}{2}$ in. from the apex and which makes an angle of 10° with the axis. Find the asymptotes of the resulting hyperbola.

3. A triangle ABC has $AB = 2''$, $BC = 1\frac{1}{8}''$ and $AC = 1\frac{1}{2}''$. A is $\frac{1}{2}$ in. above H.P. B is 1 in. above H.P. C is $1\frac{1}{4}$ in. above H.P. The plan of AB is at 15° with XY.

The points A, B and C are on the surface of a sphere 3 in. diameter. Show plan and elevation of the sphere.

4. The height of a regular hexagonal pyramid is 3 in. and the side of its base 1 in. Draw its plan when the base is inclined at 60° and one of the triangular faces is at 70° to the H.P.

5. A cone and cylinder interpenetrate each other.

The H.T.s of the solids are equal circles $\frac{7}{8}$ in. radius, touching each other, their centres being $1\frac{1}{2}$ in. from X.Y.

The generators of the cylinder are so directed that their plans cross the plans of the generators of the cone, and are at 45° to X.Y. while their elevations are at 50° to X.Y.

The apex of the cone is $\frac{1}{4}$ in. from the V.P and $2\frac{1}{2}$ in. from the H.P., and the plan of its axis is at 40° to X.Y. Show the plan and elevation of the solids, marking the interpenetration lines.

6. A right circular cylinder stands on the H.P. with its axis vertical. Its diameter is 2 in. and its length $2\frac{3}{4}$ in. Its axis is $1\frac{1}{2}$ in. from the V.P.

A sphere 2 in. diameter, touches the cylinder and rests on the H.P. The plan of the line joining the plan of the centre of the sphere and the plan of the axis of the cylinder, makes 30° with X.Y. and the sphere is at a greater distance from the V.P. than the cylinder.

Parallel rays of light are directed to the solids so that the shadow of the sphere partly falls on the cylinder, and the shadow of the cylinder partly falls on the V.P. The projections of the rays are at 45° to the X.Y.

Show the projections of the cast shadows on the planes of projection and on the cylinder.

7. Find the projection of a cube of 2 in. edge when two of the edges are inclined at 30° and 45° respectively to the projection plane.

Find also the inclination to the projection plane of the edges which are perpendicular to the plane of those at 30° and 45°.

SURVEYING, GEODESY AND TRANSPORTATION.

SECOND YEAR.

SURVEYING.

MONDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. In the farm survey at Carillon the following measurements were made on three consecutive lines:

Bearing.	Distance.
S. 26° 35′ *E*	436.1 links
N. 60 40 *E*	774.4 "
N. 28 35 *W*	407.2 "

Calculate the length and bearing of the line joining the beginning of the first to the end of the last line, and also the area of the quadrilateral formed by the four lines.

2. Describe briefly the construction of the Rochon micrometer, and explain the theory of its use as an instrument for measuring distance. The following test readings were taken at Carillon, the length of rod being 5 feet:

Distance.	Reading.
800 ft.	5.46
1000 ft.	4.64

Determine the zero correction and the constant of the instrument.

3. A 4° curve is to be run joining tangents intersecting at an angle of 64° 24°. The B. C. is at sta. 108 + 75 and the instrument to be set up at 108 + 75, 113 + 75, 118 + 00 and at the E. C.

Give the field notes for setting out the curve, the bearing of the first tangent being 60° 00′ and that of the second 124° 24′. Calculate the apex distance, and plot the curve to a scale of 100 ft. to 1 in.

4. The following angles of elevation were read with a transit upon a distant rod.

Mark on Rod.	Angle of Elevation.
4 ft.	6° 48
13 ft.	7° 30′

Calculate the horizontal distance to the rod.

5. Explain, with proof of its accuracy, the method of adjusting the levels of an instrument so that the central axis will be vertical when the bubbles are in the centre of their tubes. Why is this adjustment made (*a*) on the compass, (*b*) on the dumpy level ?

6. Sketch, with explanation of the principles of their action, three minor instruments for turning off right angles.

THIRD YEAR.

SURVEYING.

FRIDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. Determine the index error of the sextant. How can this be adjusted.

2. Test all the adjustments of the transit, and state what parts need moving to bring it into proper adjustment, and in which direction the parts should be moved.

3. Two tangents intersect at Sta. 108 + 95 having bearings of 135° 10′ and 73° 10′. Calculate the tangents for a 9° curve with transition ends between these lines, and write out the field notes for the curve. Instrument hubs must not be more than 150 ft. apart.

4. Explain in detail all the operations connected with the rating of a current meter. For what length of time may such a rating be used with accuracy ?

5. The following lines were measured in the night survey in the Engineering Building:

Line.	Bearing.	Slope.	Distance.
A — *B*	360° 00′	0° 00′	40.20
B — Plumb line	299° 57′	— 2° 27′	9.86
Down Plumb line	—	—	30.58
Plumb line — *C*	119° 57′	+14° 08′	11.99
C — *D*	268° 42′	+16° 04′	19.95

Calculate the bearing, slope and length of the line *A* — *D* and draw to a scale of 10 ft. to 1 in. a plan and elevation of the survey lines.

THIRD YEAR.

PERSPECTIVE AND MAPPING.

WEDNESDAY, APRIL 9TH:—MORNING, 9 TO 1.

1. Draw the perspective of a block 2″ x 2″ x ½″ surmounted by a square pyramid 1″ x 1″ x 3″, the sides of the block making angles of 60° and 30° with the picture plane; and also the perspective of the shadow cast by the pyramid on the top of the block, and by the combined object upon the ground plane, the projections of the light rays making angles of 45° and 45° with the ground line. Choose your point of sight.

2. Draw a perspective from the accompanying blue print.

3. The sun was observed with a corrected altitude of 17° 11′, in lat. 45° 30′ N. when his declination was — 15° 43′. Find graphically his azimuth and hour angle.

4. Explain briefly how you would calculate the quantities for plotting a map by Mercator's projection, and mention the characteristic on account of which this projection has been so largely used.

5. Explain by sketch and note how vertical and horizontal angles can be determined from a photograph, and mention the special attachments that a camera must have in order that photographs taken with it will be of value for surveying purposes.

THIRD YEAR.

PRACTICAL ASTRONOMY.

THURSDAY, APRIL 10TH:—MORNING, 9 TO 12.

1. *a* Ceti was observed in hour angle $3^h\ 35^m\ 10^s$ on March 1st, 1902, at Montreal. Calculate the mean time

of the observation. (*a*) Find also the Eastern Standard time (5^h slow of Greenwich mean time.)

2. What was the mean-time in longitude 7^h West corresponding to $18^h\ 30^m$ sidereal time in longitude 3^h East, on April 1st, 1902 ?

3. Equal altitudes of the Sun were observed on February 15th, 1902; the interval between the *a.m.* and *p.m.* observations being 5 hours. Calculate the angle between the mean direction and the meridian.

4. The *observed* altitudes of *polaris* at upper and lower meridian transits were $44^\circ\ 30'\ 00''$ and $47^\circ\ 00'\ 30''$, respectively. What was the latitude of the place of observation.

5. β Bootis was observed in Montreal on March 10th, 1902, at an altitude of $40^\circ\ 30'$. Represent on a diagram the quantities available for calculating azimuth; give the formula you would employ for this purpose and the values of the angular quantities required by the formula.

6. In the general formula for the astronomical transit $a = T + \Delta T + Aa + Bb + Cc$. Obtain the quantities A and B.

7. What is the parallax of a celestial body? (*a*) Calculate the correction for parallax to be applied to the Sun's observed altitude at meridian transit in Montreal on January 1st, 1902.

THIRD AND FOURTH YEARS.

ROADS AND CANALS.

MONDAY, APRIL 7TH:—AFTERNOON, 2 TO 5.

1. What is the duration of the ice season in various Canadian waters ?

Discuss the physical, commercial and climatic peculiarities in the different localities that determine the dates of opening and closing of navigation in each.

2. Quote average figures for the cost of transportation per ton-mile upon the Great Lakes, the St. Lawrence and Ohio Rivers, and on the Canadian and American canal systems.

3. Write out a specification for the construction of a canal bank, containing a clear statement of every precaution that must be taken in order that a sound and water-tight bank may be secured.

4. Draw a plan of a Canadian canal lock and state briefly the calculations that must be made to determine the dimensions of its parts, showing how the quantities entering into these calculations are obtained.

5. Discuss the principles that determine the design of lock valves and draw sketches of three of the best valves now in use.

6. Draw in detail a section of a street for a residential city quarter, giving exact dimensions for the construction of all its parts.

7. The permanent value of a road is mainly determined by its location. Mention all the features that you would make observation of during the location of an important road and your reasons for taking each feature into consideration.

8. Write out a specification for the construction of a first-class macadam road. Quote figures for the cost of the construction that you propose and for the maintenance of the road.

THIRD AND FOURTH YEARS.

TRANSPORTATION.

MONDAY, APRIL 7TH:—AFTERNOON, 2 TO 5.

(N.B.—*Fourth Year Students will omit questions* 4 (*a*) *and* 9.)

1. Itemize the subdivision of cost per train-mile in railroad operation.

2. Determine the hauling power of a locomotive with 36,300 lbs. on the drivers, 5′ 3″ drivers, 20″ stroke, 17″ cylinders, steam pressure 150 lbs. per square inch, maximum effective pressure 85 per cent. of boiler pressure.

3. The total weight of the engine in question (2) was 119,700 lbs. The dead weight of the cars used with it was 39.3 per cent. of the total weight of car and load. Determine the amount of paying freight that the engine could take up an 0.90 per cent. grade at 10 miles per hour. Determine also the gain in load that would result from a reduction of grade to 0.40 per 100.

4. State the sharpest curvature used in Canadian railways in various situations. (*a*) Deduce a formula for the calculation of the super-elevation of the outer rail and state how the application of such a formula is limited in practice.

5. Mention briefly the more important powers conferred on the companies by the Railway Act.

6. Draw a dimension sketch of an Am. Soc. C. E. standard rail section, illustrating particularly those parts whose dimensions have been a matter of controversy.

7. Describe how to design a pile foundation for a railway bridge pier, explaining how to calculate the amount and direction of all the forces that must be provided for. State what preliminary investigations of the foundation material you would make and how you would determine the bearing power of the piles.

8. Discuss the probable life of timber in the various situations in which it is employed in Canadian railway construction, treating particularly the causes of decay

and the measures that can be taken to prevent it. Mention the qualities of timber that account for the very frequent use of this material in Canadian works.

9. Make detail sketches of two forms of railway turnouts at present in common use. Describe how you would proceed to lay out a turnout in the field, giving all the formulae that you would use in calculating its dimensions.

FOURTH YEAR.

PRACTICAL ASTRONOMY.

1. Show that the diameter of the clear aperture of a telescope is to the diameter of its image on the eye-piece in the ratio of the magnifying power.

2. Show how to determine the eccentricity of centering of a graduated circle. Derive the necessary formulae.

3. Show by a diagram the method of compensating pendulums by the use of zinc and steel and determine the lengths of the parts.

4. How is collimation measured, in an astronomical transit, by reflection from mercury, and how is the inclination of the horizontal axis obtained in this manner?

5. Show by a sketch the repeating reflecting circle and explain its use as a repeating instrument.

6. The mean time in longitude $5^h\ 30^m$ East was $4^h\ 5^m\ 10^s$ p.m., Nov., 1st, 1901; find the corresponding sidereal time in longitude $4^h\ 54^m\ 18^s$ West.

7. The sun was observed at an altitude of 35° 10′ on Sept. 1st, 1901, in latitude 45° 30′ N. and longitude 5^h West; find the time and azimuth.

8. Derive the general equation for the transit instrument in the meridian (*a*) Mayers, (*b*) Bessels.

(*a*) A star in declination N. 75° was observed in the position L.W. and L.E. and gave values for $(\triangle T + Cc)$ differing by $1^s.27$. What was the value of c?

9. Explain the use of the zenith telescope for determining latitude and obtain the necessary formula for its use.

FOURTH YEAR.

GEODESY.

FRIDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Describe briefly three distinct methods of base line measurements now in use for primary triangulation work. (*a*) How do these methods compare as regards accuracy with the suspended tape method, and what is the probable error of a single measurement in each case?

2. Give an outline of the general system of the principal triangulation of the Indian Survey.

3. State clearly how the figure of the Earth is determined. (*a*) What are the elements of the Geometric figure employed in geodetic computations?

4. Given the observed angles of a triangle and the length of one side. The latitude and longitude of one station being known and also the azimuth of one side; how are the latitudes and longitudes of the other stations calculated?

5. Where it is necessary to occupy an eccentric station, show how to obtain a correction to reduce the observed angle to the true angle at the station.

6. What do you understand by the weight of an observation? (*a*) Suppose two sets of measurements of an angle to be made as follows:

55° 33′ 22.″4		55° 33′ 20.″0
21. 2		21. 2
23. 8	and	22. 2
24. 0		21. 8
22. 6		22. 6
		20. 6
		21. 4
55° 33′ 22.″8		55° 33′ 21.″4

What are the relative *weights* and what is the value of the weighted mean angle?

7. Determine the necessary formulae for the rigid adjustment of the measured angles of a quadrilateral, and show how to apply them.

Sessional Examinations

FACULTY OF LAW

1902.

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FIRST YEAR.

LAW OF PERSONS.

THURSDAY, APRIL 17TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,, ... G. W. MACDOUGALL.

I. What persons are recognized by our law as British subjects within Canada?

II. What is civil death, and from what disabilities does a person suffer who is civilly dead?

III. (*a*) Distinguish a domicile of origin from one of choice.

(*b*) What is the domicile of each of the following persons?

(1) A married woman;

(2) A legitimate child;

(3) A legitimated child;

(4) A domiciled Lower Canadian who leaves the Province with the intention of never returning and who dies on a voyage to France, where he intended to live permanently;

(5) The son of an Englishman who is born in France, where his father is residing for the moment, although domiciled without being naturalized in America.

IV. Under what conditions can a married woman

(*a*) Enter an action at law;

(*b*) Carry on business as a public trader;

(*c*) Bind herself for the payment of her husband's debts.

V. What periods does the Code recognize with respect to an absentee, and how is his property dealt with during each of these periods?

VI. Enumerate the grounds of nullity that can be invoked against a marriage, distinguishing absolute from relative nullities.

VII. What is the general nature of an alimentary debt, and how is it dischargeable?

VIII. What are the effects of a judgment in an action for separation as to bed and board both as to the person and property of the consorts.

IX. How is a minor emancipated, and what powers does he then obtain over his property?

X. What is interdiction? For what causes can it be demanded and how is the order obtained?

FIRST YEAR.

CONSTITUTIONAL LAW.

TUESDAY, APRIL 15TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,. . . . . PROF. WALTON.

1. What were the main points settled in Campbell v. Hall?

2. Discuss as fully as you can the grievances signalised by Lord Durham.

3. Explain the canons laid down by the Privy Council in deciding whether an act is *ultra vires*, and refer to some of the cases in which the provincial authority to legislate with regard to "property and civil rights" has been interpreted.

4. Trace the progress of a money Bill through Parliament.

5. Explain as fully as possible the importance of the distinction between written and unwritten, rigid and flexible constitutions, and indicate the character of the Canadian constitution.

FIRST YEAR.

CIVIL PROCEDURE.

FRIDAY, APRIL 18TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,, ... G. W. MACDOUGALL.

I. What are the powers and jurisdiction of the Superior Court in this Province?

II. What is an interlocutory judgment, and when is

3. Under what circumstances can moveables become immoveable?

4. A partnership owns immoveable property; is the share of the partner in the partnership moveable or immoveable and why?

5. What is ownership? Are there any limitations to complete ownership?

6. Is the owner entitled to the fruits? Is the possessor?

7. How does the owner regain the immoveable of which he finds another in possession?

8. The owner having regained his property, has he any restitution to make to the possessor in good faith for improvements made by the latter? Is there any restitution by the possessor towards the proprietor?

9. When is a possessor said to be in good faith or in bad faith?
What is meant by title in this connection?

10. What obligations are incumbent upon the usufructuary before entry into possession?

11. Can he be dispensed from them and how?

12. What is the result of the Insolvency of the usufructuary when dispensed from giving security?

13. What is the result of the failure to fulfil the obligations (Question ten) on the usufructuary's right to the fruits?

FIRST YEAR.

LAW OF OBLIGATIONS.

MONDAY, MARCH 3RD:—AFTERNOON, 2.30 TO 5.30.

Examiner, ... MR. AIME GEOFFRION.

1. Define the following terms, giving examples: Real right, personal right, obligation, contract, absolute nullity, relative nullity, quasi-contract, delict, quasi-delict.

2. What remedies and resources has a creditor when

the debtor fails to execute the obligation? When and for what purpose is putting in default required? How is it made?

3. What is solidarity and when does it exist? What is subrogation and when does it take place?

4. In what cases, if any, can an obligation be paid by another than the debtor, even against the will of the creditor? Are there cases where payment to another than the creditor is valid? In what place must payment be made?

5. Define novation, confusion, compensation. What are the conditions required for legal compensation? What is facultative compensation? What are the effects of impossibility to execute an obligation?

SECOND YEAR.

MARRIAGE COVENANTS, MINOR CONTRACTS, PRIVILEGES.

SATURDAY, APRIL 12TH:—AFTERNOON, 2.30 TO 5.30.

Examiner, ... PROF. FORTIN.

1. An immoveable in possession of a consort at the time of marriage, is subsequently claimed by a third party who is the owner thereof; but, as the result of a transaction and for consideration, it is retained by such consort:

What is the right of the community, upon such immoveable?

Give full reasons.

2. Upon what grounds can the wife demand separation of property? What are the effects of such separation? How and on what conditions can the community be re-established?

3. What property of the children is subject to the enjoyment of the surviving consort? What are the obligations incurred by such enjoyment?

4. What is continuation of community? When did it take place? What property fell into the same?

5. What constitutes the dower of the wife? When is it open? That of the children? *Quid* if the latter have accepted the succession of their father?

What are the charges of the dower of the wife?

6. What is the effect of the renunciation of the wife to the community:

(*a*) As to the debts thereof?

(*b*) As to her own property?

What is the nature of her claim upon the property of the husband?

7. What are the obligations of a depositary? *Quid* in deposit of a sum of money? Is he entitled to retain the same by way of compensation?

8. What is the essential difference between loan for use and loan for consumption? What are the obligations of the borrower in each case?

9. What recourse may be exercised by the surety who has paid the debt? When can he proceed before payment?

10. What is a privilege? How is it created? What claims are privileged upon moveable property?

SECOND YEAR.

CIVIL PROCEDURE AND EVIDENCE.

MONDAY, APRIL 7TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,.. .. ..PERCY C. RYAN.

1. What are the rules as to the responsibility of guardians and depositaries of moveable property under seizure?

2. Outline the proceedings leading up to the appointment of a curator in the case of a judicial abandonment made by a trader who has ceased his payments.

3. A judgment condemned B., a tutor, to render to A., his former pupil, an account of his administration within thirty days from the rendering of judgment, or in default of so doing within such delay, to pay a sum of $5,000 to represent the balance due. What remedy or

remedies has A. if B. fails to render an account within the delay fixed?

4. What proceedings should be adopted by a party to obtain relief from a judgment rendered in consequence of documents the falsity of which has been discovered only after judgment?

5. A. has a judgment against B., a member of a commercial partnership consisting of B. and C. What means can A. adopt to enforce his judgment against B's rights in the partnership?

6. Draft an opposition to withdraw by a third party who is the owner of moveable effects under seizure.

7. A. sued B. for $500, amount of a promissory note signed by B., payable to A's order. The writ was served at B's domicile when he was temporarily absent from the Province. B. made default to appear and A. obtained judgment. B. first learned of the judgment on his return to the Province, and also found that a seizure by garnishment had been served on his employer and at his own domicile. B. contends that he was released in writing by A. before suit brought. What proceedings should B. take to annul the judgment? Draft the initial proceeding.

8. Give the rules as to resale for false bidding.

9. In what cases may a deposit be required from bidders at a sheriff's sale of immoveables.

10. State the meaning of the rule as to the best evidence.

When may secondary evidence be made.

(*a*) of documents?

(*b*) of other declarations?

11. Explain fully the meaning of the expression "commencement of proof in writing."

12. In what cases will interlocutory judgments be reviewed by the Court of King's Bench on an appeal from the final judgment?

SECOND YEAR.

PRIVATE INTERNATIONAL LAW.

SATURDAY, APRIL 19TH:—AFTERNOON, 2.30 TO 5.30.

1. An inhabitant of the State of Vermont is served with an action in the Province of Quebec by a physician duly qualified to practice in that Province, claiming remuneration for professional services rendered in Vermont to the defendant. By the laws of that State the Plaintiff has no right to practice medicine there, not having obtained a certificate from the board of censors in the state. The law of Vermont provides that a person practising against the provisions of the Statute shall not be permitted to enforce the collection of any claim for services rendered, and shall be liable to a penalty for contravention of the Statute. Argue the case for the defendant.

2. A person domiciled in California, where testamentary capacity is attained at the age of 18, makes a will at the age of 20 disposing of immoveable property in the Provinces of Ontario and Quebec. What principles would govern the validity of the bequest in these provinces?

3. What theories have been advanced as to the law which should govern the devolution of an abintestate succession, and which of these doctrines has been adopted by the Courts of this Province?

4. A child is born out of wedlock of parents then domiciled in England. The parents subsequently acquire a domicile and are married in this Province. Does this marriage render the child legitimate

(*a*) in England;

(*b*) in the Province of Quebec?

5. By the laws of the State of New York, a married woman can sue and be sued in the Courts of law like a *feme sole* without requiring marital or judicial authorization. Can a married woman while domiciled in that state institute proceedings in our courts without such authorization? Can she, after acquiring a domicile in Quebec, sue without such authorization?

6. What rules should our courts observe with respect to the recognition of foreign decrees of divorce?

7. In the absence of marriage covenants what law determines the mutual rights of husband and wife to each other's moveable or immoveable property? Cite the leading cases on this subject in England and in this province, and state whether the same doctrine is followed by the courts in the United States.

8. Can an action be maintained in the Province of Quebec for damages for a libel published in a foreign country where such publication, though not innocent or justifiable, is not actionable?

9. In what cases would our courts refuse to give extra-territorial effect to foreign laws or to rights claimed thereunder?

10. Discuss the extraterritorial operation of a judgment of interdiction with regard to foreign creditors dealing with the interdict in ignorance of such judgment.

SECOND YEAR.

REAL PROPERTY LAW.

TUESDAY, APRIL 15TH:—AFTERNOON, 2.30 TO 5.50.

Examiner, ... PROF. MARLER.

1. What are the characteristics of Hypothec as distinguished from other real rights?

2. Is it a real right? Why?

3. From what causes do Hypothecs arise?

4. Does a foreign marriage give the wife the right to a legal Hypothec?

5. What rights does the legal Hypothec of the wife Secure?

6. How is the registration of the legal Hypothec of the wife effected?

7. How is a Judicial Hypothec registered?

8. What are the essentials necessary to create a valid Conventional Hypothec?

9. What change has the Code introduced with respect to Conventional Hypothec?

10. Can Conventional Hypothec result from a private writing?

11. What obligations can be secured by Hypothec?

12. Can a person Hypothecate what does not belong to him?

13. During what period can a Conventional Hypothec be registered so as to give it due effect?

14. What exception is there to the rule that Hypothec's rank in the order of registration?

15. What is the object of the Hypothecary action?

16. The holder of an hypothecated immoveable deteriorates it. What are the rights of the hypothecary creditor? How can he enforce them?

17. What do you mean by the Exception of discussion? Who can set it up?

18. A Hypothec and a builder's privilege exist against land sold by the Sheriff. How do these rank and how are they paid?

SECOND AND THIRD YEARS.

GIFTS AND SUCCESSIONS.

MONDAY, MARCH 24TH:—MORNING, 10 TO 1.

Examiner. . . . . THE HON. MR. JUSTICE DOHERTY.

Questions to be answered by Students of Second and Third Years.

1. What are the essentials of the Gift *inter vivos?* Mention one important requirement for the passing of property by gift under the old law, which is not essential under the Code.

2. Do you make any distinction as regards their nature between the conditions to which a gift *inter vivos* may be made subject, and those to which an onerous contract may be subjected? If so, what distinction, and what is the reason of it?

3. A. makes a donation to a child conceived, but not

yet born. The child's mother accepts on its behalf. What is the effect of the donation?

If the donation were not accepted till after the birth of the child, and A. had died before acceptance, what would be the effect of the donation? What would be the effect if A. though living at the date of the acceptance were not present at it, and died before becoming aware of the acceptance?

Reasons for your answers.

4. A. makes a donation to B., on the condition that the latter shall pay all debts that A. may contract subsequently to the donation. What is the effect of the donation?

If instead of stipulating payment of all debts to be subsequently incurred by him, A. had stipulated for the payment of specified debts to be incurred to the amount of $1,000. What would be the effect of the donation?

Reasons for your answer.

5. Point out the differences, if any, between the effects of the revocation of a donation consequent upon the fulfilment of a resolutory condition, and those of the revocation by reason of ingratitude?

6. How may a cumulative gift of present and future property be validly made? What are the rights of a donee under such a donation?

7. Define the fiduciary substitution. By what acts may it be created? To how many degrees may it extend?

8. What are the respective rights of institute and substitute in the substituted property before the opening of the substitution?

Questions to be answered by Graduating Class only.

9. When and to what extent does representation take place.

(*a*) In abintestate successions.
(*b*) In Legacies.
(*c*) In substitutions.

Where it takes place, what is its effect?

10. A. makes a gift to B., his grand-son, stipulating

the right to take back the property given in the event of B. dying before him, intestate, and leaving no descendants.

The condition is fulfilled. (*a*) What right has A. in the property given? (*b*) What right, if any, would he have had to the property given, had the donation not contained the stipulation above mentoned? (*c*) If in either, or both cases, he have any right to the property given, how would such right be affeced by the donee's having alienated during his life time the property given? and (*d*) to what extent, if any, would it carry with it liability for the donee's debts?

11. At what periods must capacity to receive exist.
(*a*) On the part of a donee?
(*b*) On the part of a legatee?
(*c*) On the part of a substitute?
What in each case, is the effect upon the ownership of the object of the disposition, of the absence of such capacity at the period or periods at which it is required?

12. In what cases, if any, are the following dispositions valid:
(*a*) The gift of a thing belonging to another.
(*b*) The bequest of a thing belorging to another.
(*c*) The substitution of a thing belonging to another. When valid, what are their efects?

SECOND AND THIRD YEARS.

HISTORY OF LAW, CORPORATIONS, AGENCY AND PARTNERSHIP.

THURSDAY, APRIL 17TH:—AFTERNCON, 2.30 TO 5.30.

Examiner, ... PROF. MCGOUN.

1. In what cases can Provincial companies be brought under the operation of the Winding Up Act?

2. What is the basis of our law of Mortmain, and how is it affected by the provisions of the Companies Act and the General Clauses Acts, Federal and Provincial?

3. What procedure must be adopted for the issue of preferential debenture stock?

4. What is the rule of the civil or common law as to voting by proxy at meetings of Companies, and how is it affected by the General Clauses Acts?

5. When is the contract of mandate gratuitous, and when does it become onerous?

Has the principal the right to revoke the mandate, first, when it is gratuitous, secondly, when onerous, and what are the consequences of revocation in the two cases?

6. What is the chief practical difference between civil and commercial partnerships, and between partnerships and joint stock companies?

7. What interpretation has been given in the case of Reid & McFarlane, to the rule that participation in the profits of a partnership carries with it an obligation to contribute to the losses?

8. How can judgment against one partner for a partnership debt be executed? *Quid* if the debt be a personal debt of the partner?

9. Distinguish between the ordinances of the French king requiring registration and those not requiring registration by the Council of Quebec. Mention three ordinances of each class.

10. What was the *retrait lignager* under the Custom of Paris, and state whether any trace of this remains in our law?

SECOND AND THIRD YEARS.

COMMERCIAL LAW.

SALE, BILLS AND NOTES.

THURSDAY, APRIL 10TH:—AFTERNOON, 2.30 TO 5.30.

Examiner, ... PROF. R. C. SMITH.

1. What limitations are there of the power to buy and sell as regards the parties and the object of the sale?

2. What are the seller's obligations as to warranty?

3. A., a wholesale dry goods merchant, buys a lot of cloth from a manufacturer and though having no license as an auctioneer, he sells it by public auction to B., a jobber, who in turn sells it to C., a retailer. The manufacturer is unpaid.

Has he any recourse against the goods and if so, upon what will it depend?

4. (*a*) What was enacted by the 17th Section of the Statute of Frauds?

(*b*) What is our law upon the subject?

5. Is a bill of exchange invalid because:—

(*a*) It is not dated.

(*b*) It does not specify that any value has been given for it.

(*c*) It orders the payment of the amount half in cash and half in goods.

(*d*) It does not specify the place where it is payable.

(*e*) It orders the payment out of a particular fund.

(*f*) It is addressed to two drawees in the alternative.

6. Discuss the case of Vagliano vs. The Bank of England.

7. If an agent having a power of attorney authorizing him to sign notes for his principal, in abuse of his authority, make notes for his own purposes, is the principal liable on them?

Cite a case in support of your opinion?

8. What is meant by the terms:—
"holder," "holder for value" and "holder in due course?"

INSURANCE—CARRIERS—BANKING.

(For Third Year Only.)

9. What are the obligations of the insured (*a*) as to representations (*b*) as to warranty?

10. Is the insurer ever liable after a deviation during the voyage?

Is he liable for particular average losses, or for loss by salvage?

11. For what losses are carriers liable and to what extent may they limit their liability by notice of special conditions?

12. What power has a bank as to lending money and what security may it take?

SECOND AND THIRD YEARS.

CRIMINAL LAW AND PROCEDURE.

TUESDAY, APRIL 1ST:—MORNING, 10 TO 1.

Examiner. . . . . THE HON. MR. JUSTICE DAVIDSON.

Questions 1 *to* 17 *inclusive to be answered by Second and Third Year Students.*

Questions 18 *to* 21 *inclusive to be answered by Third Year Students only.*

1. What is the procedure in this Province to obtain a Writ of Habeas Corpus?

2. What is the rule as to the obtainment of the writ by a person confined by process in a civil cause?

3. What are the rights of the applicant for the writ to produce affidavits on the return of the writ.
State the facts and decision in Q. v. Cavelier, 1. C. C. C. 134, in his respect.

4. What makes a person an accessory after the fact?

5. State the law on the subject as regards:—
(*a*) wife and husband.
(*b*) husband and wife.

6. What things are capable of being stolen?

7. When are creatures wild by nature:—
(*a*) capable of being stolen.
(*b*) not capable of being stolen.

8. Define theft.

9. State your views as to the possible theft of water, gas, electricity.

10. What were the facts and what was held in R. v. Hands (1887), 16 Cox C. C. 188, as to obtaining a package from an automatic machine by dropping a worthless brass disc instead of a penny into the slot.

11. When is receiving property dishonestly obtained an indictable offence?

12. What important addition to the preceding law does the Criminal Code definition of this offence, introduce?

13. A steals two fifty dollar bills, and obtains for them other bills of smaller denominations, which he hands to B. who receives them with a full knowledge of the original theft and of the subsequent exchange. What defence in law might B. offer? State an authority.

14. What is "a false pretence?"

15. Distinguish between obtaining by false pretences and theft.

16. For what purposes may a Criminal Court sit on Sunday?

17. What is meant by "a reserved case." When is it granted? Is the remedy available to the prosecution as well as the defense?

18. Define "Affray," "Riot," "Burglary."

19. To what proceedings does the Canada Evidence Act, 1893, apply?

20. What is the procedure when an accused on being arraigned refuses to plead?

21. How many peremptory challenges has an accused indicted for Treason or an offence punishable with death?

SECOND AND THIRD YEARS.

CONSTITUTIONAL LAW AND OBLIGATIONS.

SATURDAY, APRIL 19TH:—AFTERNOON, 2.30 TO 5.30.

Examiners,..PROF. WALTON and Mr. AIME GEOFFRION.

A.

1. Explain the circumstances which led up to the Constitutional Act, and give its main provisions.

2. Explain the grievances respecting (*a*) squatters; and (*b*) clergy reserves. How were these dealt with, and when?

3. What cases have interpreted "direct taxation," and in what sense?

4. Explain the rights of the Dominion and the Provincial governments respectively with regard to (*a*) fisheries, (*b*) education and (*c*) temperance.

5. Describe cabinet-government.

B.

Please write answers to A and B in separate books.

1. Enumerate and explain the different incapacities to contract, stating in what cases and under what conditions they exist, their extent and their effect on the validity of the contract.

2. Can a creditor (*a*) exercise the rights and actions of his debtor, (*b*) impeach the latter's acts? If so, when, under what conditions and with what effect?

3. Give the essential elements of a delict and a quasi-delict. Enumerate and explain all the cases of responsibility for other persons and for things.

4. Give the principal rules of law concerning solidarity.

5. Give the rules that govern imputation of payments.

THIRD YEAR.

ROMAN LAW.

FRIDAY, DEC. 20TH, 1901:—MORNING, 10 TO 1.

Examiner. . . . . PROF. WALTON.

1. Describe the main features in the organization of the early Roman family.

2. What were the principal forms of conveyance known to the early law? Describe them. For what purposes, besides that of the transfer of property, were these forms employed?

3. What were the wife's rights in the *dos*? How were they secured, and by what actions were they enforced?

4. A. buys a house from B., whom he believes to be the owner. Five years afterwards he discovers B. was not the owner. How will this affect A.'s rights? Can he acquire the ownership, and, if so, when?

5. A. builds a house on the land of B. Discuss the rights of A. and B. respectively.

6. Sketch the history of the *testamentum tripertitum*.

7. A., who dies after Justinian, leaves a son, a mother and a brother. By his will he disinherits his son and leaves his whole estate to a charitable institution. Have the heirs any claim ?

8. A. sells to B. a horse, which is upon a ship bound for Naples, provided that the ship shall arrive safely in port. Unknown to A. and B., the ship had arrived before the contract was made. Next day the horse was killed by accident. Discuss the law.

9. Explain (*a*) *actio contraria commodati*; (*b*) *depositum miserabile*.

10. What legal relation is entered into under the following circumstances:

(*a*) A. ploughs B.'s field on condition that B. ploughs A.'s field.

(*b*) A. employs B. to make him a suit of clothes.

(*c*) A. gives his son B. the use of his farmhouse for life.

(*d*) A., who is a slave, borrows money from B.

Point out in each case the main legal effects.

THIRD YEAR.

REAL PROPERTY LAW.

TUESDAY, APRIL 15TH:—AFTERNOON, 2.30 TO 5.50.

Examiner, ... PROF. MARLER.

Before X., a Notary, etc., appeared A. who sold to B., present and accepting, an emplacement in the city of Montreal, of 23 feet in width, by 100 feet in depth, known as Lot No. 97, on the official Plan and Book of Reference of the St. Antoine Ward of the City of Montreal, without any buildings thereon, for the price of $1,000, whereof B. has paid to A. $400, the receipt whereof is acknowledged, and the balance of $600, B. promised to pay to A. on the 15th April, 1904, with interest at legal rate.

A. declared this and other property to be hypothecated to C., against which hypothec he will protect B.

Whereof acte, etc., dated the 15th April, 1902.

1. What is this contract? Why not exchange or donation?

2. State briefly what are A.'s obligations towards B.

3. B. acquired for the purpose of building a house, for which he has made plans and let contracts; when he commences to build A. can only deliver 20 feet by 100. What are B.'s rights?

4. B. does not pay the $600 and interest when due. How can A. make him?

5. Has B. any defence to the action?

6. What security has A. for the payment of this sum against the land sold?

7. Can he cancel the sale because B. does not pay?

8. What right of action has C. against B.?

9. What is the nature, what are the conditions and what is the object of the action?

10. How could C.'s right of hypothec have arisen?

11. What defence has B. to C.'s action?

12. Suppose that C. is A.'s heir and has accepted his succession.

13. Suppose that B. has erected a house.

14. How can the above deed be registered?

15. What delays, if any, have A. and B. respectively for registration?

16. What is the effect of a delay given for registration?

17. B. borrows money from D., and gives him a hypothec on the land in question, what are the essentials to the validity of the hypothec?

18. A. obtains judgment against B. for the $600 and interest, how will he proceed against the land in question which B. has sold to E.: 1. when the deed from B. to E. has been registered; 2. when it has not been registered?

19. How would this alienation affect the action of C. against B. in question 8?

20. The land in question is sold by the Sheriff; the certificate of search discloses, 1. the $600 and interest due A.; 2. the hypothec from B. to D.; 3. a builder's

claim in favour of F. How will these claims be collocated and how paid if the price is insufficient to pay them in full?

21. In building, B. desires to use the wall of the adjoining house. Can he do so, and what has he to pay?

22. A. is a married man, can he sell without his wife's consent? Reason for answer.

23. A. is a married woman, separate as to property from her husband, can she sell without her husband's consent?

24. What rights are untouched by a Sheriff's sale?

25. Can the above deed be registered, if the official number had not been given?

THIRD YEAR.

INTERNATIONAL LAW.—(*Public and Private.*)

SATURDAY, APRIL 19TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,.....PROF. LAFLEUR.

1. Discuss the correctness of the attitude of the Belgian Government in 1870, in refusing the passage over Belgian railways to the German wounded after Sedan.

2. Examine the validity of the objections made by Boer representatives in the United States to the shipment of mules and horses by private citizens out of New Orleans to the British Army in South Africa.

3. Give a brief summary of the "Alabama" case.

4. State and explain the laws of blockade.

5. What vessels are excepted from the general rule that private property at sea is confiscable at the hands of a hostile belligerent?

6. An inhabitant of the State of Vermont is served with an action in the Province of Quebec by a physician duly qualified to practice in that province, claiming remuneration for professional services rendered in Vermont to the defendant. By the laws of that State the plaintiff has no right to practice medicine there, not having obtained a certificate from the board of censors

in the state. The law of Vermont provides that a person practising against the provisions of the statute shall not be permitted to enforce the collection of any claim for services rendered, and shall be liable to a penalty for contravention of the statute. Argue the case for the defendant.

7. A person domiciled in California, where testamentary capacity is attained at the age of 18, makes a will at the age of 20, disposing of immoveable property in the Provinces of Ontario and Quebec. What principles would govern the validity of the bequest in these provinces?

8. A child is born out of wedlock of parents then domiciled in England. The parents subsequently acquire a domicile and are married in this Province. Does this marriage render the child legitimate

(*a*) in England;

(*b*) in the Province of Quebec?

9. By the laws of the State of New York a married woman can sue and be sued in the courts of law like a *feme sole* without requiring marital or judicial authorization. Can a married woman while domiciled in that state institute proceedings in our courts without such authorization? Can she, after acquiring a domicile in Quebec, sue without such authorization?

10. What rules should our courts observe with respect to the recognition of foreign decrees of divorce?

THIRD YEAR.

CIVIL PROCEDURE AND EVIDENCE.

MONDAY, APRIL 7TH:—AFTERNOON, 2.30 TO 5.30.

Examiner,. . . . . PERCY C. RYAN.

1. Outline the proceedings leading up to the appointment of a curator in the case of a judicial abandonment made by a trader who has ceased his payments.

2. A judgment condemned B., a tutor, to render to A., his former pupil, an account of his administration within thirty days from the rendering of judgment, or in de-

fault of so doing within such delay, to pay a sum of $5,000 to represent the balance due. What remedy or remedies has A. if B. fails to render an account within the delay fixed?

3. Draft an opposition to withdraw by a third party who is the owner of moveable effects under seizure.

4. A. sued B. for $500, amount of a promissory note signed by B., payable to A.'s order. The writ was served at B.'s domicile when he was temporarily absent from the Province. B. made default to appear and A. obtained judgment. B. first learned of the judgment on his return to the Province, and also found that a seizure by garnishment had been served on his employer and at his own domicile. B. contends that he was released in writing by A. before suit was brought. What proceedings should B. take to annul the judgment. Draft the initial proceeding.

5. Give the rules as to resale for false bidding.

6. State the meaning of the rule as to the best evidence. When may secondary evidence be given

(*a*) of documents;
(*b*) of other declarations?

7. Explain fully the meaning of the expression: "commencement of proof in writing."

8. In what cases will interlocutory judgments be reviewed by the Court of King's Bench on an appeal from the final judgment?

9. Explain the cases in which simple attachment may issue, and draft the affidavit in any one of them.

10. By what persons and with what formalities can proceedings be taken to prevent a number of persons from acting as a corporation without being legally incorporated or recognized?

11. Can the conclusions of a declaration be amended, and if so, in what cases?

12. How are answers to interrogatories on articulated facts given on behalf of a corporation which is a party to the suit?

THIRD YEAR.

MARRIAGE COVENANTS—PRESCRIPTION—LEASE AND HIRE, MINOR CONTRACTS—MUNICIPAL LAWS.

SATURDAY, APRIL 12TH:—AFTERNOON, 2.30 TO 5.30.

Examiner, ... PROF. FORTIN.

1. An immoveable in possession of a consort at the time of marriage, is subsequently claimed by a third party who is the owner thereof, but, as the result of a transaction and for consideration, it is retained by such consort.

What is the right of the community upon such immoveable?

Give full reasons.

2. Upon what grounds can the wife demand separation of property? What are the effects of such separation? How and upon what conditions can the community be re-established?

3. What is continuation of community? When did it take place? What property fell into the same? What is the benefit of inventory of the wife accepting the community?

What is its effect:

1. As regards the husband or his heirs?
2. As regards the creditors?

Quid in case of debt originally due by the wife?

4. What constitutes the dower of the wife? When is it open? That of the children? *Quid* if the latter have accepted the succession of their father?

What are the charges of the dower of the wife?

5. Explain fully the rule: *Quae temporalia sunt ad agendum, perpetua sunt ad excipiendum*, giving reasons in support, and examples of its application:

1. With regard to immoveables;
2. With regard to moveable actions?

6. An annual rent due by a third party is given by will to B. By a codicil the legacy is revoked and the rent bequeathed to C., but B. receives the arrears thereof during more than 10 years, *animo domini:* Has he ac-

quired the rent by prescription? *Quid* if the codicil had been concealed by B. and unknown to C? Give reasons.

7. A lessor refuses to deliver the thing leased: What recourse can be exercised by the lessee?

The thing leased becomes defective during the occupation of the lessee and damage is suffered in consequence by him:

Is the lessor responsible?

8. A house is destroyed by fire and the lessor brings suit against the lessee for the value thereof:

How can the latter successfully repel the action?

Quid if there were several tenants?

9. The creditor has allowed a hypothec attached to his claim to be lost by prescription: Will it effect the surety and to what extent?

10. The election of a municipal councillor, not qualified to hold the office, has not been contested during the ordinary delays: Is such councillor entitled to remain in office? If not, how can he be removed?

MATRICULATION

AND

SCHOOL EXAMINATIONS

JUNE, 1902.

MEDICAL LIBRARY

PRELIMINARY SUBJECTS.

ENGLISH GRAMMAR.

MONDAY, JUNE 9TH:—MORNING, 9 TO 10.30.

(N.B.—*Not more than two questions in each section are to be answered. B 6 and C 8 are compulsory.*)

A.

1. Give the feminine (Nominative Singular) of *wizard, marquis, wolf, colt, monk;* and the Possessive Plural of *fox, princess, sheep, ox, mouse.*

2. Classify the various uses of *that,* and give two examples of each.

3. What is the difference between Strong and Weak Verbs? Give the Past Tense and Past Participle of the following, and state whether each is Weak or Strong: *abide, bend, flee, lay, ride, sit, slay.*

B.

4. Make a list of the Auxiliary Verbs, and state the different purposes for which they are used. Give examples.

5. Define Voice, Mood, Tense, Person. Give the uses of the Subjunctive, with examples.

6. Parse the words in italics in the following sentence: A man *that* is *young* in *years, may* be old in hours, *if he have lost no time.*

C.

7. Correct the following sentences where you think it necessary, giving reasons:—

(*a*) Between you and I, people do not like him.

(*b*) Have you any objection to him going?

(*c*) These are stupid errors, and which ought to be avoided.

(*d*) He does not write like I do.

(*e*) Every one of the crowd were lost in amazement.

8. Analyse the following:—

The Sun now rose upon the right:
Out of the sea came he,
Still hid in mist, and on the left
Went down into the sea.

ENGLISH COMPOSITION.

MONDAY, JUNE 9TH:—MORNING, 11 TO 12.

Write an essay of not less than one page on any *one* of the following subjects:

Wireless Telegraphy;
Winter Sports in Canada;
An Ideal Holiday.

ENGLISH DICTATION.

MONDAY, JUNE 9TH:—MORNING, 10.30 TO 11.

There is so often a threatening note, something blatant and metallic, in the voice of bells, that I believe we have fully more pain than pleasure from hearing them; but these, as they sounded abroad, now high, now low, now with a plaintive cadence that caught the ear like the burthen of a popular song, were always moderate and tunable, and seemed to fall in with the spirit of still, rustic places, like the noise of a waterfall or the babble of a rookery in spring. I could have asked the bell-ringer for his blessing, good, sedate old man, who swung the rope so gently to the time of his meditations. I could have blessed the priest or the heritors, or whoever may be concerned with such affairs in France, who had left these sweet old bells to gladden the afternoon, and not held meetings, and made collections, and had their names repeatedly printed in the local paper, to rig up a peal of brand-new, brazen substitutes, who should bombard their sides to the provocation of a brand-new bell-ringer, and fill the echoes of the valley with terror and riot.

ENGLISH HISTORY.

TUESDAY, JUNE 10TH:—MORNING, 10.30 TO 12.

In answering the first three questions, any four parts of each may be selected. On the contrary, the whole of the fourth question must be answered.

1. (*a*) Describe the Court of Star Chamber as it was in the days of Henry VII.

(*b*) What were the Six Articles and why are they important?

(*c*) What do you know of John Dudley, Duke of Northumberland?

(*d*) Name five important events which happened during the reign of Mary I.

(*e*) Give a list of English voyages of discovery which were made during the reign of Elizabeth.

(*f*) Enumerate the main achievements of the Earl of Essex.

2. (*a*) What was the attitude of James I towards Spain?

(*b*) Give the date of the Short Parliament and explain the nature of its importance.

(*c*) Sketch the chief features of Cromwell's government.

(*d*) Outline the leading incidents of the Popish Plot.

(*e*) Describe the battle of La Hogue.

(*f*) When and how were England and Scotland united under one Parliament?

3. (*a*) What was the South Sea Bubble?

(*b*) When and between whom was the battle of Quiberon Bay fought? Name the English commander?

(*c*) Describe the mutiny at Spithead.

(*d*) Outline Canning's foreign policy.

(*e*) What do you know of the Duke of Wellington as a politician?

(*f*) When and why did England suffer from a great cotton famine?

4. (*a*) What was the attitude of Queen Elizabeth towards the Church?

(*b*) Describe Monmouth's rebellion.

(*c*) When was the battle of Blenheim fought? Name the English commander.

(*d*) What do you know of Lord Melbourne's ministry?

ARITHMETIC.

TUESDAY, JUNE 10TH:—MORNING, 9 TO 10.30.

Answer only two questions from each section.

SECTION I.

1. There are 1,836,472,000 copies of newspapers printed in America in a year. Taking a newspaper on the average at 4,000 copies solid to the foot, find the number of miles in a column formed of these copies; also taking 41 inches as the average length, find the number of miles they would cover if placed end to end.

2. Simplify $\frac{\frac{1}{2}-\frac{1}{3}}{\frac{1}{2}+\frac{1}{3}}$ of $\frac{\frac{1}{4}-\frac{1}{5}}{\frac{1}{4}+\frac{1}{5}}$ of $\frac{\frac{1}{6}-\frac{1}{7}}{\frac{1}{5}+\frac{1}{7}}$ of 585

3. Divide $4,633.75 among 5 boys, 2 women and 2 men, so that each man has four times as much as a woman and each woman five times as much as a boy.

SECTION II.

4. Define a meter. How many inches are there in a meter? Express to three decimal places an English mile in meters.

5. A pipe furnishes 30 litres of water per hour. Assuming one gallon to weigh 10 lbs, find the number of gallons supplied by the pipe in 24 hours.

6. If 20 men can excavate 185 cubic yds. of earth in 9 hours, how many men could do half the work in a fifth of the time?

SECTION III.

7. The interest on a sum of money at the end of 6 1-4 years is three-eighths of the sum itself; what rate per cent was charged?

8. Find the present value of $1,465 due two years hence at 4 per cent. per annum.

9. The length of one side of a retangular field is 572 yards, and the area of the field is 50.7 acres. Find the length of the other side and of the diagonal.

OPTIONAL SUBJECTS.

GREEK.—(*First Paper*).

FRIDAY, JUNE 13TH:—MORNING, 9 TO 1.

XENOPHON ANABASIS I.

1. Translate with explanation of construction of words underlined:—

(*a*) Ὅστις δ' ἀφικνοῖτο τῶν παρὰ βασιλέως πρὸς αὐτόν, πάντας οὕτω διατιθεὶς ἀπεπέμπετο ὥσθ' ἑαυτῷ μᾶλλον φίλους εἶναι ἢ βασιλεῖ. Καὶ τῶν παρ' ἑαυτῷ δὲ βαρβάρων ἐπεμελεῖτο, ὡς πολεμεῖν τε ἱκανοὶ εἴησαν καὶ εὐνοϊκῶς ἔχοιεν αὐτῷ. Τὴν δὲ Ἑλληνικὴν δύναμιν ἤθροιζεν ὡς μάλιστα ἐδύνατο ἐπικρυπτόμενος, ὅπως ὅτι ἀπαρασκευότατον λάβοι βασιλέα.

(*b*) Ἐνταῦθ' ἔμεινεν ὁ Κῦρος καὶ ἡ στρατιὰ ἡμέρας εἴκοσιν· οἱ γὰρ στρατιῶται οὐκ ἔφασαν ἰέναι τοῦ πρόσω· ὑπώπτευον γὰρ ἤδη ἐπὶ βασιλέα ἰέναι· μισθωθῆναι δὲ οὐκ ἐπὶ τούτῳ ἔφασαν. Πρῶτος δὲ Κλέαρχος τοὺς αὑτοῦ στρατιώτας ἐβιάζετο ἰέναι· οἱ δ' αὐτόν τε ἔβαλλον καὶ τὰ ὑποζύγια τὰ ἐκείνου, ἐπεὶ ἤρξατο προϊέναι.

(*c*) Τὸ δὲ στράτευμα ὁ σῖτος ἐπέλιπε, καὶ πρίασθαι οὐκ ἦν. εἰ μὴ ἐν τῇ Λυδίᾳ ἀγορᾷ ἐν τῷ Κύρου βαρβαρικῷ, τὴν καπίθην ἀλεύρων ἢ ἀλφίτων τεττάρων σίγλων. Ὁ δὲ σίγλος δύναται ἑπτὰ ὀβολοὺς καὶ ἡμιοβόλιον Ἀττικούς· ἡ δὲ καπίθη δύο χοίνικας Ἀττικὰς ἐχώρει. Κρέα οὖν ἐσθίοντες οἱ στρατιῶται διεγίγνοντο. Ἦν δὲ τούτων τῶν σταθμῶν οὓς πάνυ μακροὺς ἤλαυνεν, ὁπότε ἢ πρὸς ὕδωρ βούλοιτο διατελέσαι ἢ πρὸς χιλόν.

(*d*) Ἐνταῦθα Κῦρος Σιλανὸν καλέσας τὸν Ἀμπρακιώτην μάντιν ἔδωκεν αὐτῷ δαρεικοὺς τρισχιλίους, ὅτι τῇ ἐνδεκάτῃ ἀπ' ἐκείνης τῆς ἡμέρας πρότερον θυόμενος εἶπεν αὐτῷ ὅτι βασιλεὺς οὐ μαχεῖται δέκα ἡμερῶν· Κῦρος δ' εἶπεν, Οὐκ ἄρα ἔτι μαχεῖται, εἰ ἐν ταύταις οὐ μαχεῖται ταῖς ἡμέραις· ἐὰν δ' ἀληθεύσῃς, ὑπισχνοῦμαί σοι δέκα τάλαντα. Τοῦτο τὸ χρυσίον τότε ἀπέδωκεν, ἐπεὶ παρῆλθον αἱ δέκα ἡμέραι.

(*e*) Εἰ δέ τινα ὁρῴη δεινὸν ὄντα οἰκονόμον ἐκ τοῦ δικαίου, κατασκευάζοντά τε ἧς ἄρχοι χώρας καὶ προσόδους ποιοῦντα, οὐδένα ἂν πώποτε ἀφείλετο, ἀλλ' ἀεὶ πλείω προσεδίδου· ὥστε καὶ ἡδέως ἐπόνουν, καὶ θαῤῥαλέως ἐκτῶντο, καὶ ἃ ἐπέπατο αὖ τις ἥκιστα Κῦρον ἔκρυπτεν· οὐ γὰρ φθονῶν τοῖς φανερῶς πλουτοῦσιν ἐφαίνετο, ἀλλὰ πειρώμενος χρῆσθαι τοῖς τῶν ἀποκρυπτομένων χρήμασιν.

II. Parse fully:—λάβοι, προϊέναι, πρίασθαι, ἀπέδωκεν, ἐκτῶντο.

III. Short notes on:—Ἀβροκόμας, Ἐνυάλιος, Κτησίας, Χερρόνησος.

XENOPHON.—ANABASIS II.

1. Translate with explanation of construction of words underlined:—

(*a*) Ταῦτα μὲν εἶπον οἱ βασιλέως κήρυκες· οἱ δὲ Ἕλληνες βαρέως μὲν ἤκουσαν, ὅμως δὲ Κλέαρχος τοσοῦτον εἶπεν, ὅτι οὐ τῶν νικώντων εἴη τὰ ὅπλα παραδιδόναι· Ἀλλ', ἔφη, ὑμεῖς μέν, ὦ ἄνδρες στρατηγοί, τούτοις ἀποκρίνασθε ὅ τι κάλλιστόν τε καὶ ἄριστον ἔχετε· ἐγὼ δὲ αὐτίκα ἥξω. Ἐκάλεσε γάρ τις αὐτὸν τῶν ὑπηρετῶν, ὅπως ἴδοι τὰ ἱερὰ ἐξῃρημένα· ἔτυχε γὰρ θυόμενος.

(*b*) Οὐ μὲν δη αὐτοῦ γε μένειν οἷόν τε· τὰ γὰρ ἐπιτήδεια οὐκ ἔστιν ἔχειν· ἰέναι δὲ παρὰ τοὺς Κύρου φίλους πάνυ καλὰ ἡμῖν τὰ ἱερὰ ἦν. Ὧδε οὖν χρὴ ποιεῖν· ἀπιόντας δειπνεῖν ὅ τι τις ἔχει. Ἐπειδὰν δὲ σημήνῃ τῷ κέρατι ὡς ἀναπαύεσθαι, συσκευάζεσθε· ἐπειδὰν δὲ τὸ δεύτερον, ἀνατίθεσθε ἐπὶ τὰ ὑποζύγια· ἐπὶ δὲ τῷ τρίτῳ ἕπεσθε τῷ ἡγουμένῳ, τὰ μὲν ὑποζύγια ἔχοντες πρὸς τοῦ ποταμοῦ, τὰ δὲ ὅπλα ἔξω.

(*c*) Καὶ ἐνταῦθα ἦν Κλέαρχον καταμαθεῖν ὡς ἐπεστάτει, ἐν μὲν τῇ ἀριστερᾷ χειρὶ τὸ δόρυ ἔχων, ἐν δὲ τῇ δεξιᾷ βακτηρίαν· καὶ εἴ τις αὐτῷ δοκοίη τῶν πρὸς τοῦτο τεταγμένων βλακεύειν, ἐκλεγόμενος τὸν ἐπιτήδειον ἔπαισεν ἄν, καὶ ἅμα αὐτὸς προσελάμβανεν εἰς τὸν πηλὸν ἐμβαίνων· ὥστε πᾶσιν αἰσχύνην εἶναι μὴ οὐ συσπουδάζειν. Καὶ ἐτάχθησαν μὲν πρὸς αὐτὸ οἱ τριάκοντα ἔτη γεγονότες· ἐπεὶ δὲ καὶ Κλέαρχον ἑώρων σπουδάζοντα, προσελάμβανον καὶ οἱ πρεσβύτεροι.

(*d*) Μετὰ δὲ ταῦτα ἀνεπαύοντο· ἐπὶ μέντοι τὴν γέφυραν ὅμως φυλακὴν ἔπεμψαν· καὶ οὔτε ἐπέθετο οὐδεὶς οὐδαμόθεν οὔτε πρὸς τὴν γέφυραν οὐδεὶς ἦλθε τῶν πολεμίων, ὡς οἱ φυλάττοντες ἀπήγγελλον. Ἐπειδὴ δὲ ἕως ἐγένετο, διέβαινον τὴν γέφυραν ἐζευγμένην πλοίοις τριάκοντα καὶ ἑπτά, ὡς οἷόν τε μάλιστα πεφυλαγμένως· ἐξήγγελλον γάρ τινες τῶν παρὰ Τισσαφέρνους Ἑλλήνων, ὡς διαβαινόντων μέλλοιεν ἐπιθήσεσθαι· ἀλλὰ ταῦτα μὲν ψευδῆ ἦν· διαβαινόντων μέντοι ὁ Γλοῦς αὐτοῖς ἐπεφάνη μετ' ἄλλων, σκοπῶν εἰ διαβαίνοιεν τὸν ποταμόν· ἐπειδὴ δὲ εἶδεν, ᾤχετο ἀπελαύνων.

(*e*) Ταῦτα οὖν φιλοπολέμου μοι δοκεῖ ἀνδρὸς ἔργα εἶναι, ὅστις, ἐξὸν μὲν εἰρήνην ἄγειν ἄνευ αἰσχύνης καὶ βλάβης, αἱρεῖται πολεμεῖν· ἐξὸν δὲ ῥᾳθυμεῖν, βούλεται πονεῖν ὥστε πολεμεῖν· ἐξὸν δὲ χρήματα ἔχειν ἀκινδύνως, αἱρεῖται πολεμῶν μείονα ταῦτα ποιεῖν. Ἐκεῖνος δὲ ὥσπερ εἰς παιδικὰ ἢ εἰς ἄλλην τινὰ ἡδονὴν ἤθελε δαπανᾶν εἰς πόλεμον· οὕτω μὲν φιλοπόλεμος ἦν. Πολεμικὸς δὲ αὖ ταύτῃ ἐδόκει εἶναι ὅτι φιλοκίνδυνός τε ἦν, καὶ ἡμέρας καὶ νυκτὸς ἄγων ἐπὶ τοὺς πολεμίους, καὶ ἐν τοῖς δεινοῖς φρόνιμος, ὡς οἱ παρόντες πανταχοῦ πάντες ὡμολόγουν.

II. Parse fully :—ἐξῃρημένα, ἰέναι, ἐτάχθησαν, ᾤχετο, ὡμολόγουν.

III. Short notes on :—Ἀριαῖος, Ἐκβάτανα, Μηδίας Τεῖχος, Μιλτοκύθης.

GREEK (*Second Paper*).

FRIDAY, JUNE 13TH :—MORNING, 9 TO 1.

GRAMMAR.

1. Give gen. sing. and acc. plur. of στρατιώτης, ἵππευς, χείρ, πατήρ, ἥρως, οὖς, γυνή.

2. Decline in sing. ὅστις, ὅδε.

3. Give comparative and superlative of ἡδύς, αἰσχρός, φίλος, ταχέως.

4. Give 1st pl. fut. ind. act ; 2nd sing. aor. opt.

act; 3rd sing. perf. ind. act; 2nd sing. aor. ind. mid.; 1st plur. pres. ind. pass.; perf. inf. pass.; and acc., fem. sing. pres. part. act. of *μανθάνω*, *κλέπτω*, *βάλλω*, *φέρω*, *αἱρέω*, *λανθάνω*, *ἀνίστημι*, *ἀπόλλυμι*.

5. Write out in full Attic forms of pres. opt. act. of *νικάω*, past tense ind. of *οἶδα*, imperf. ind. of *εἶμι*.

B.—COMPOSITION.

Put into Greek:—

1. On the same night the king himself arrived, having six hundred horsemen.

2. He asked whether they had heard what was said or not.

3. The soldier was killed while crossing the river, by one of the barbarians.

4. They marched for three days through the enemy's country and on the fourth they encamped near a spring.

5. No one shall say that I compel those who do not wish to go against the king.

6. The men of old honoured those who died for their country.

7. The general, being wiser than the soldiers, would not allow them to attack the enemy at once.

C. Translation at Sight.

Translate into English:—

Ἀκούω τινὰ διαβάλλειν, ὦ ἄνδρες, ἐμέ, ὡς ἐγὼ ἄρα ἐξαπατήσας ὑμᾶς μέλλω ἄγειν εἰς Φᾶσιν. Ἀκούσατε οὖν μου, πρὸς θεῶν· καὶ ἐὰν μὲν ἐγὼ φαίνωμαι ἀδικῶν, οὐ χρή με ἐνθένδε ἀπελθεῖν πρὶν ἂν δῶ δίκην· ἂν δ' ὑμῖν φαίνωνται ἀδικοῦντες οἱ ἐμὲ διαβάλλοντες, οὕτως αὐτοῖς χρῆσθε ὥσπερ ἄξιον. Ὑμεῖς δ', ἔφη, ἴστε δήπου ὅθεν Ἥλιος ἀνίσχει καὶ ὅπου δύεται, καὶ ὅτι, ἐὰν μέν τις εἰς τὴν Ἑλλάδα μέλλῃ ἰέναι, πρὸς ἑσπέραν δεῖ πορεύεσθαι· ἢν δέ τις βούληται εἰς τοὺς βαρβάρους, τοὔμπαλιν πρὸς ἕω. Ἔστιν οὖν ὅστις τοῦτο ἂν δύναιτο ὑμᾶς ἐξαπατῆσαι, ὡς Ἥλιος, ἔνθεν μὲν ἀνίσχει, δύεται δ' ἐνταῦθα· ἔνθα δὲ δύεται, ἀνίσχει, δ' ἐντεῦθεν.

LATIN.—(*First Paper.*)

WEDNESDAY, JUNE 11TH:—MORNING, 9 TO 11.15.

I. LATIN GRAMMAR. (Time ¾ hour.)

1. Decline, marking by the usual sign all long vowels: puer, deus, caput, mos, tu, idem.

Decline together: solus filius, proelium acre.

2. Give the meaning, gender, and gen. sing. of vis, caedes, ager, arma, lapis, vulgus.

3. Give the comparative and superlative of felix, dives, asper, similis, benevolus, novus; leviter, audacter, saepe.

4. Write down the Latin for: thirty-six, a thousand men, two thousand men, eighteen, in the year 1882, one epistle.

5. Give the mood, tense, and person, with the meaning, of the following:—fuerim, possent, prodestis, vocanto, visus es, viceramus, munivit, eamus, amandus eram, eunto.

6. Give the principal parts of iuvo, sto, veto, pareo, caedo, suadeo, augeo, hortor, vivo, tollo.

7. Translate (carefully explaining the constructions): (*a*) Tibi parcitur: (*b*) ad Italiam venit: (*c*) me miserum: (*d*) cui bono? (*e*) metus deorum: (*f*) peritus belli: (*g*) pudet me tui: (*h*) servum quinque minis emit.

II. LATIN PROSE COMPOSITION. (Time ¾ hour.)

1. I must write this letter at once.

2. I asked him whether he lived at Rome.

3. He said that it was of importance to him to remain in the city.

4. Having procured provisions, he marched to those places in which he had heard the Germans were.

5. When Caesar was twelve miles distant from the enemy, the ambassadors returned to him.

6. He put Quintus in command of that garrison and the fleet.

7. I am going away that I may not see the soldiers.

8. When Caesar had inquired into these matters, he sent the cavalry in advance and ordered the legions to follow at once.

9. These ships will be useless for crossing the river.

III. Translation at Sight. (Time ¾ hour.)

A.

Quibus cognitis rebus Pompeius, deposito adeundae Syriae consilio et aeris magno pondere ad militarem usum in naves imposito duobusque milibus hominum armatis, Pelusium pervenit. Ibit casu rex erat Ptolemaeus, puer aetate, magnis copiis cum sorore Cleopatra bellum gerens, quam paucis ante mensibus per suos propinquos atque amicos regno expulerat; castraque Cleopatrae non longo spatio ab eius castris distabant. Ad eum Pompeius misit ut pro hospitio atque amicitia patris Alexandria reciperetur atque illius opibus tegeretur. Sed qui ab eo missi erant, confecto legationis officio, liberius cum militibus regis conloqui coeperunt eosque hortari ut suum officium Pompeio praestarent neve eius fortunam despicerent. In hoc erant numero complures Pompei milites quos ex eius exercitu acceptos in Syria Gabinius Alexandriam traduxerat belloque confecto apud Ptolemaeum, patrem pueri, reliquerat.

B.

Cura, quid expediat, prior est quam quid sit honestum,
Et cum fortuna statque caditque fides:
Nec facile invenies multis in milibus unum,
Virtutem pretium qui putet esse sui.
Ipse decor recti, facti si praemia desint.
Non movet, et gratis paenitet esse probum.
Nil, nisi quod prodest, carum est. En detrahe menti
Spem fructus avidae, nemo petendus erit.

LATIN.—(*Second Paper.*)

TRANSLATION FROM PRESCRIBED BOOKS.

Wednesday, June 11th:—Morning, 11.15 to 1.

CAESAR AND VIRGIL.

I. Caesar.

1. Translate:

(*a*) At Caesar etsi nondum eorum consilia cognove-

rat, tamen et ex eventu navium suarum et ex eo quod obsides dare intermiserant, fore id quod accidit suspicabatur. Itaque ad omnes casus subsidia comparabat. Nam et frumentum ex agris quotidie in castra conferebat, et quae gravissime afflictae erant naves, earum materia atque aere ad reliquas reficiendas utebatur, et quae ad eas res erant usui ex continenti comportari fubebat. Itaque cum summo studio a militibus administraretur, xii navibus amissis reliquis ut navigari commode posset effecit.

(*b*) At hostes, posteaquam ex nocturno fremitu vigiliisque de profectione eorum senserunt, collocatis insidiis bipertito in silvis opportuno atque occulto loco a milibus passuum circiter duobus, Romanorum adventum exspectabant; et cum se maior pars agminis in magnam convallem demisisset, ex utraque parte eius vallis subito se ostenderunt, novissimosque premere et primos prohibere ascensu atque iniquissimo nostris loco proelium committere coeperunt.

2. Translate, and account for the construction of italicised words:

(*a*) Hi rursus in vicem *anno* post in armis sunt, illi *domi* remanent. (*b*) Neque multum *frumento*, sed *maximam partem* lacte atque pecore vivunt. (*c*) Caesar statuit *sibi* Rhenum esse transcundum. (*d*) Sed meridie, cum Caesar *pabulandi* causa tres legiones atque omnem equitatum cum Gaio Trebonio legato *misisset*, repente ex omnibus partibus ad pabulatores advolaverunt, sic uti ab signis non *absisterent*. (*e*) "Vincite," inquit, "se ita vultis," Sabinus, et id clariore voce, ut magna pars militum exaudiret: "neque is sum," inquit, "qui gravissime ex vobis mortis periculo *terrear:* hi sapient, et si gravius quid acciderit. abs te rationem reposcent." (Write out in Indirect Narration the words of Sabinus).

II. Virgil.

1. Translate:

Omnis spes Danaum et coepti fiducia belli
Palladis auxiliis semper stetit. Impius ex quo
Tydides sed enim, scelerumque inventor Ulixes,
Fatale aggressi sacrato avellere templo

Palladium, caesis summae custodibus arcis,
Corripuere sacram effigiem, manibusque cruentis
Virgineas ausi divae contingere vittas;
Ex illo fluere ac retro sublapsa referri
Spes Danaum, fractae vires, aversa deae mens.

2. Scan the first two lines of this extract.

3. Translate, and write brief notes on words printed in italics:

(*a*) Et iam *Argiva phalanx* instructis navibus ibat
A *Tenedo* tacitae per amica silentia lunae
Litora nota petens.

(*b*) *Sigea* igni *freta* lata relucent.

(*c*) Iam summas arces Tritonia, respice, Pallas
insedit, nimbo effulgens et *Gorgone saeva.*

(*d*) Tum verum omne mihi visum considere in ignis
Ilium et ex imo verti *Neptunia* Troia.

ALTERNATIVE PAPER IN LATIN FOR ONTARIO CANDIDATES.

(May be substituted for the Second Paper of the University School Examinations).

1. Translate:—

(*a*) Tamen non eaffugit civium suorum invidiam. Namque ob eumdem timorem, *quo* damnatus erat Miltiades, testarum suffragiis e civitate eiectus. Argos *habitatum* concessit. Hic cum propter multas eius virtutes magna cum dignitate viveret, Lacedaemonii legatos Athenas miserunt, qui eum absentem *accusarent*, quod societatem cum rege Persarum ad Graeciam opprimendam fecisset. Hoc crimine *absens* proditionis est damnatus.

(*b*) Eodem die legati ab hostibus missi ad Caesarem de pace venerunt. His Caesar numerum obsidum quem ante imperaverat duplicavit, eosque in continentem adduci iussit, quod propinqua die aequinoctii infirmis navibus hiemi navigationem subiiciendam non existimabat. Ipse idoneam tempestatem nactus paulo post mediam noctem naves solvit, quae omnes incolumes ad continentem pervenerunt; sed ex iis

onerariae duae eosdem quos reliquae portus capere non potuerunt et paulo infra delatae sunt.

(*c*) "Heu nihil invitis fas quemquam fidere divis!
Ecce trahebatur passis Priameïa virgo
Crinibus a templo Cassandra adytisque Minervae,
Ad caelum tendens ardentia lumina frustra,
Lumina,—nam teneras arcebant vincula palmas.
Non tulit hanc speciem furiata mente Coroebus,
Et sese medium iniecit periturus in agmen.
Consequimur cuncti et densis incurrimus armis.
Hic primum ex alto delubri culmine telis
Nostrorum obruimur, oriturque miserrima caedes
Armorum facie Graiarum errore iubarum.

2. (*a*) Explain the construction of italicised words in 1 (*a*).

(*b*) Scan the first two lines of 1 (*c*).

3. Translate:—

(*a*) Nos nihil de eo per contationibus reperiebamus, nisi certis ex aqua mensuris breviores esse quam in continenti noctes videbamus.

(*b*) Sed ea celeritate atque eo impetu milites ierunt, cum capite solo ex aqua exstarent, ut hostes impetum legionum atque equitum sustinere non possent ripasque dimitterent ac se fugae mandarent.

(*c*) Quamquam adeo excellebat Aristides abstinentia, ut unus post hominum memoriam, quod quidem nos audierimus, cognomine Justus sit appellatus; tamen a Themistocle collabefactus, testula illa exsilio decem annorum multatus est.

FRENCH.

MONDAY, JUNE 9TH:—AFTERNOON, 3.30 TO 5.30.

N.B.—*Candidates are requested to write the answers to questions in Groups A and B in separate books.*

A.

I. Translate into English:

J'ai essayé bien souvent depuis de me rappeler l'impression exacte que me fit Paris cette nuit-là; mais les choses comme les hommes, prennent, la première fois

que nous les voyons, une physionomie toute particulière, qu'ensuite nous ne leur trouvons plus. Le Paris de mon arrivée, je n'ai jamais pu me le reconstruire. C'est comme une ville brumeuse que j'aurais traversée tout enfant, il y a des années, et où je ne serais plus retourné depuis lors.

Je me souviens d'un pont de bois sur une rivière toute noire, puis d'un grand quai désert et d'un immense jardin au long de ce quai. Nous nous arrêtâmes un moment devant ce jardin. A travers les grilles qui le bordaient, on voyait confusément des huttes, des pelouses, des flaques d'eau, des arbres luisant de givre.

Moi, serré contre mon frère, je regardais de tous mes yeux à travers les grilles, et mêlant dans un même sentiment de terreur ce Paris inconnu, où j'arrivais de nuit, et ce jardin mystérieux, il me semblait que je venais de débarquer dans une grande caverne noire, pleine de bêtes féroces qui allaient se ruer sur moi. Heureusement que je n'étais pas seul: j'avais Jacques pour me défendre.

II. Grammatical questions.

1. Write the 1st pers. sing. and the 1st pers. plur. (*a*) of the preterite (past definite), (*b*) of the perfect (past indefinite), and (*c*) of the future of the following verbs:—*se rappeler, fit, prennent, voyons, souviens, allaient, défendre, pu.*

2. How is the adverb *confusément* formed?

Give the three rules for the formation of adverbs.

Give the adverbs corresponding to *gentil, frais, bon, mauvais, joli, récent, lent, heureux.*

3. Explain the use of the imperfect, past definite and the past indefinite in French. Form sentences to illustrate your answers.

4. Write correctly the following participles and give rules:—Ils se sont *aimé* et ils se le sont *dit.* C'e belle chanson, je l'ai *entendu* chanter. Il nous a *vu* et nous a *parlé.* Nous sommes *venu* vous voir.

B.

(*To be written in a separate book.*)

I. Translate into French:—

An oriental story relates that one day a Mussul-

man priest ascended the desk (*la chaire*) and spoke as follows: "O children of the faithful, do you know what I am going to say?" They answered, "No, How should we know before you told us?" "Then," said he, "it is useless for me to talk to such stupid people."

The next day he mounted the pulpit he asked (*faire*) the same question. "Yes," was the answer. "In that case," said the priest, "I need not tell you."

The next time, then, they answered, "Some of us do, and some of us do not." "Well," said he, "let those who know tell those who do not."

II. (Last half hour of the examination).
Reproduce in French the story read by the examiner.

MONDAY, JUNE 9TH:—AFTERNOON, 5 TO 5.30.

Story to be reproduced in French.

N.B.—At the beginning of the last half hour of the examination the presiding examiner will read distinctly the following story to the candidates twice. It is not to be placed in their hands.

The keeper of a certain "menagerie" used to require those who were unable to pay admission to bring a live animal to be given to the lion. A man who wanted to see the great beast caught a little black dog in the street and put it into the lion's cage. The poor creature lay on its back before the king of beasts, held up its paws and seemed to beg for mercy. The lion looked at it attentively a while, then turned it over with one paw, smelt it, and seemed to desire to be friends. Then the keeper brought the lion's dinner. But the lion would not take it, but looked at the dog, as if inviting it to take some first. When the dog's courage had returned, and it had tasted the food, the lion drew near, and they finished the meal together. From this time they were inseparable friends. The dog played with the lion, and even slept between his paws. After about a year the little dog died. At first the lion thought it was asleep, but when he realized it was dead, he grew uneasy, and

paced his cage, and roared terribly in his grief. He would not allow the carcass to be removed, but lay down with his dead little friend between his paws, and refused all food. If living dogs were put into the cage, he tore them to pieces in fury, but did not devour them. After five days the lion was found dead one morning with his head reclining on the body of his little friend.

GERMAN.

THURSDAY, JUNE 13TH:—AFTERNOON, 2 TO 4.

(*Candidates may substitute question* 5 *for question* 1.)

1. Translate into English:—

(*a*) Früher ſtand einige hundert Schritte vor dem erſten Hauſe des Dorfes auf einem grünen Raſenhügel eine alte mächtige Buche. Die Bauern ſagten, ſie ſtamme noch aus der Heidenzeit, und ein heiliger Apoſtel ſei unter ihr von den falſchen Heiden erſchlagen worden. Wer weiß, ob 's wahr iſt? Eine eigne Bewandtnis aber hatte es mit dem Baum; das wußte jeder, Klein und Groß, im Dorf. Wer unter ihm einſchlief und träumte, deß Traum ging unabweiſlich in Erfüllung. Eine beſondere Bedingung war jedoch dabei: wer ſich zum Schlaf legte unter die Traumbuche, durfte nicht daran denken, was er wohl träumen würde. That er es doch, ſo träumte er nichts wie verworrenes Zeug, aus dem kein vernünftiger Menſch klug werden konnte.

2. Translate into German:—

(*a*) A few days ago a little boy asked me what o'clock it was. As I had no watch I looked up at the sun to guess the time, when the clock on the church across the river struck half past one.

(*b*) What are you going to do this summer? I hope to go to Europe with some friends. We should like to go through Switzerland on bicycles (*Fahrrad*, n). The Swiss (*Schweizer*) roads are said to be the best in the world.

(*c*) I know some one who would have liked to go with you, but he could not have been away (*abwesend*) so long; for you could not return within less than three months from such a trip.

(*d*) A servant was once ordered by his master to go and look at (*nach*) the thermometer, to see if it had fallen. "Oh no," said he, when he returned, "it is still hanging on (*an*) the nail."

3. Grammar. (*Answer any* four *questions*).

(*a*) Write the other two principal parts of *stand, ging, durfte, denken, that, verworren, konnte, gebrochen, schlang.*

(*b*) Give the genitive sing. and genitive plural of *kein kluger Mensch, die alte Buche.* How does *der* (pronoun) decline? How can you tell whether *der* is a relative or demonstrative pronoun in a sentence? Illustrate your answer clearly.

(*c*) What gender are nouns formed with the following suffixes:— *ei,— heit,— lein,— schaft,— in?* Give examples and meanings.

(*d*) Give (*a*) three conjunctions that do not affect the order of words in a German sentence, (*b*) three which cause inversion, (*c*) three which cause transposition. Give illustrative sentences in each case.

(*e*) What is a *cognate?* How is English related to German? What are the English cognates of *Zeichen, Wald, tränken, Vogel, Zimmer?* Add any remarks that these words suggest.

4. Translate (*at sight*):—

Nicht zu leugnen ist es, daß Allen das Herz klopfte, als die Tritte sich vorsichtig dem Hause näherten.

Der Hauptmann hatte das Fenster geöffnet und lauschte hinter dem Laden; die Übrigen traten ihm nach und vernahmen nun flüsternde Stimmen, aber ohne den Inhalt der Worte zu verstehen. Einige Minuten wurde alles still, dann verrieten die knisternden Zweige des Epheus, daß die Diebe heraufzuklettern begannen.

Plötzlich klirrte ein Fenster des Saals, und nun griffen der Hauptmann und seine Gefährten nach den Gewehren, denn jetzt galt es, auf der Hut zu sein, wollte man die Beute sich nicht entwischen lassen.

Durch einen Spalt der nicht ganz geschlossenen Thüre war ein Teil des Saals zu übersehen. Man erblickte zwei Männer, die vorsichtig vom Fenster herunterglitten.

5. Translate into English:—

(*a*) Die blühenden Gesträuche thaten sich von selbst auseinander und öffneten den Knaben einen Pfad. Gebrochen blinkte das Sonnenlicht durch das Gitterdach der Waldbäume und malte tausend goldene Augen auf das Moos, und aus dem Moos stiegen Sternblumen von brennenden Farben, und grünes, krauses Geränke schlang sich um die bemoosten Stämme. Droben aber in den Zweigen flatterten singende Vögel in schimmernden Federkleidern, und Hirsche, Rehe und andere Waldtiere sprangen durch die Büsche.

Auerbach.

(*b*) Kennst du das Haus? Auf Säulen ruht sein Dach,
Es glänzt der Saal, es schimmert das Gemach,
Und Marmorbilder stehn und sehn mich an:
"Was hat man dir, du armes Kind gethan?"
Kennst du es wohl?
Dahin! Dahin
Möcht' ich mit dir, o mein Beschützer, ziehn.
Kennst du den Berg und seinen Wolkensteg?
Das Maultier sucht im Nebel seinen Weg;
In Höhlen wohnt des Drachen alte Brut;
Es stürzt der Fels und über ihn die Flut,
Kennst du ihn wohl?
Dahin! Dahin
Geht unser Weg! o Vater, laß uns ziehn!

Goethe.

ALGEBRA.

MONDAY, JUNE 9TH:—AFTERNOON, 2 TO 3.30.

(All work must be shown; results alone will not be valued).

1. Simplify (*a*) $\frac{2x^3-5x^2-8x-16}{2x^3+11x^2+16x+16}$

(*b*) $\frac{x^2+6x-7}{2x^2-7x+5} \times \frac{3x^2+7x+4}{x^2+4x-21} \times \frac{2x^2-11x+15}{9x^2-16}$

(*c*) $\frac{3+\sqrt{6}}{5\sqrt{3}-2\sqrt{12}-\sqrt{32}\ \sqrt{50}}$

2. Find the square root of

$$(a-b)^4-2\,(a^2+b^2)\,(a-b)^2+2\,(a^4+b^4)$$

3. A broker bought a number of shares of Dominion Coal stock, when they were selling at a certain price, for $3,120, and afterwards, when the price of each share had increased fifty per cent. in value, sold all but 20 shares for $3,240. Find how many shares he bought.

4. A caterer provided dinner for a club of 24 members and fixed the price of the tickets so as to gain one-eighth upon his outlay. Only 21 members attended the dinner, and these paid the fixed price. The caterer lost $1.00 on the dinner. Find the charge per ticket.

5. Solve the following equations:—

(*a*) $$\frac{2}{2x-3}+\frac{1}{x+2}=\frac{6}{3x+2}$$

(*b*) $$\begin{aligned}(a-b)\,x+(a+b)\,y&=2\,(a^2-b^2),\\ ax-by&=a^2+b^2\end{aligned}$$

(*c*) $$\sqrt{x-a}+\sqrt{x-b}=\sqrt{a+b}$$

6. Solve the following equations:—

(1) $$\frac{(x-2)}{x-3}+\frac{3x-11}{x-4}=\frac{4x+13}{x+1}$$

(2) $$\begin{aligned}x^2+y^2+xy&=61\\ x+y&=9\end{aligned}$$

GEOMETRY.

TUESDAY, JUNE 10TH:—AFTERNOON, 2 TO 4

1. If from the ends of a side of a triangle there be drawn two straight lines to a point within the triangle, these two straight lines shall be together less than the other two sides of the triangle, but shall contain a greater angle.

2. If two equal triangles be on the same base, but on opposite sides of it, the straight line which joins their vertices will be bisected by the base.

3. Describe a parallelogram that shall be equal to a

given triangle, and have one of its angles equal to a given angle.

4. If a straight line be divided into two equal and also into two unequal segments, the sum of the squares on the two unequal segments is double the sum of the squares on half the line and on the line between the points of section. Prove this proposition (*a*) by means of a geometrical construction; (*b*) without a geometrical construction.

5. In every triangle the square on the side opposite an acute angle is equal to the sum of the squares on the other two sides diminished by twice the rectangle contained by either of these and the distance between the acute angle and the foot of the perpendicular let fall upon it from the opposite angle.

6. If two chords of a circle cut one another and do not both pass through the centre, they do not bisect one another.

7. If a series of equal cords be placed in a circle, their middle points will lie on the circumference of another circle concentric with the former.

8. An angle at the centre of a circle is double of an angle at the circumference which stands on the same arc.

TRIGONOMETRY.

TUESDAY, JUNE 10TH:—AFTERNOON, 4 TO 5.30.

1. Define the unit of circular measure and find its value in seconds.

2. Find the values of the ratios of 60°, 90°, 225°, 1,470°.

3. Trace the changes of sign in the tangent of an angle as the angle increases from 0° to 360°.

4. Prove the following relations:—

(1.) $tan\ A + cot\ A = sec\ A.cosec\ A$

(2.) $1 - tan^4\ A = 2\ sec^2 A - sec^4\ A$

(3.) $\frac{1 - sin\ A}{1 + sin\ A} = (secA - tanA)^2$

(4.) $sin^6\theta + cos^6\theta = 1 - 3\ sin^2\theta cos^2\theta$

5. Prove:—

(*a*) $\dfrac{\sin(A+B)+\sin(A-B)}{\cos(A+B)+\cos(A-B)} = \tan A$

(*b*) $\dfrac{\tan\theta+\tan\phi}{\tan\theta-\tan\phi} = \dfrac{\sin(\theta+\phi)}{\sin(\theta-\phi)}$

(*c*) $\tan(A+B) = \dfrac{\tan A+\tan B}{1-\tan A\tan B}$

(*d*) $\sin A+\sin B = 2\sin\dfrac{A+B}{2}\cos\dfrac{A-B}{2}$

6. Given that the sine of an angle is $\frac{3}{4}$, construct the angle. Shew that two such angles can be constructed. Find all the other ratios, explaining your work.

MATHEMATICS.—*(Part II.)*.

THURSDAY, JUNE 12TH:—MORNING, 9 TO 11.

I. GEOMETRY.

1. (*a*) Inscribe a square in a circle.

(*b*) Circumscribe a square about the same circle.

(*c*) Prove that the circumscribed square is double the inscribed one.

2. Inscribe a regular hexagon in a circle.

3. Divide a given straight line in a given ratio. (*a*) Divide it also externally in the same ratio.

4. If four straight lines be proportional, the rectangle contained by the extremes is equal to the rectangle contained by the means.

II. ALGEBRA.

5. Find the sum of a number of terms in geometrical progression.

Insert 3 geometric means between 486 and 6.

6. If the number of permutations of n things four at a time be fourteen times the number of permutations of n-2 things three at a time, find n.

7. Expand by the binomial theorem $\left(ax + \frac{y}{a}\right)^9$ and write down the midde term of $\left(\frac{2}{3}a - \frac{3}{2a}\right)^6$

8. If log 3 =. 4771213, find the value of log 729. Prove your method.

ARITHMETIC.

TUESDAY, JUNE 17TH:—AFTERNOON, 2 TO 3.30.

1. Divide $1,986.50 among A. B. and C., in the proportion 2.3, 1.15 and .524.

2. By investing a certain sum of money in the 6 per cents. at 91 1-2, a man obtains an income of $320. What would he obtain by investing an equal sum in the 5 per cents. at 80?

3. A hollow, cubical box, made of material 1.3 inches in thickness has an interior capacity of 50.653 cubic feet; determine the length of the outside edge of the box.

4. Find the number of cubic feet in the trunk of a tree 70 feet long, the diameters of its ends being 10 and 7 feet.

5. Find the radius of a sphere that shall contain exactly a cubic yard.

6. Find by logarithms the value of $(2.75)^4$ to four decimal places.

ENGLISH LANGUAGE.

TUESDAY, JUNE 17TH:—MORNING, 10.30 TO 12.30.

(*Question* 11 *is compulsory.*)

1. Take from Trench, and without comment, a single word to illustrate each of the following heads:

(*a*) the vanishing of the idea of God.
(*b*) a sick man playing on his name.
(*c*) "shape and configuration" giving a name.
(*d*) a name suggesting "the legend and not the legend the name."

(*e*) the Arab as the chemists of the Middle Ages.
(*f*) a derivative from *Bagdad*.
(*g*) a derivative from "the braggart of the Roman comedy."
(*h*) the use of pebbles for counting.
(*i*) assimilation (underline the illustrative portion.)
(*j*) dissimilation (underline the illustrative portion.)

2. What light does language throw on the life of the Indo-European peoples before they separated?

3. Contrast the vocabularies of Saxon and Norman.

4. Treat the following subjects:
(*a*) fair words for ugly things.
(*b*) needless scruples about words.
(*c*) Johnson's Dictionary.
(*d*) etymologies at random.

5. Write about half a page on some subject of importance not touched on in the previous questions.

6. Classify the letters v, k, d, t, z under the heads *surds* and *sonants;* also under the heads *stops* and *spirants;* also according to the vocal organs which are chiefly concerned in producing them.

7. Illustrate the formation of abstract nouns from (*a*) adjectives, (*b*) verbs, (*c*) nouns; also of masculine nouns from feminine.

8. On what grounds may *the* and *an* be regarded as belonging to a separate part of speech? What changes in spelling does the comparison of adjectives involve?

9. Explain and illustrate the use of verbal forms in *ing*. Give the second person singular of the nine primary tenses of the verb *bid* and also of the perfect continuous tenses of the same verb.

10. Parse carefully and fully the word *as* in the following sentences and, when possible, say what it modifies:
(*a*) As you work, so will you succeed.
(*b*) He is as strong as he is active.
(*c*) The event is such as I expected.
(*d*) He walks as if he were hurt.

11. Analyse:
None judge so wrong as those who think amiss.

ENGLISH LITERATURE.

THURSDAY, JUNE 12TH:—MORNING, 11 TO 12.30.

Candidates for A. A. will answer three groups, namely: (1) A *or* B; (2) C; (3) D *or* E.

Candidates for Matriculation only, two groups, namely: (1) A *or* B; (2) C.

Ontario candidates will find instructions and questions on the third page.

A.—TENNYSON.

1. (*a*) State clearly the sources from which Tennyson drew the materials for the following poems: *The Lady of Shalott, Ulysses, Tithonus, The Revenge.*

(*b*) In each of the above mentioned poems point out one quality which you think especially characteristic of Tennyson.

2. In what poem does each of the following quotations occur?

(*a*) But unfamiliar Arno and the dome
Of *Brunelleschi.*

(*b*) Thro' the long-tormented air
Heaven flashed a sudden jubilant ray.

(*c*) thro' mountain clefts the dale
Was seen far inland, and the yellow *down*
Bordered with palm.

(*d*) Then he turn'd
His face and *pass'd*—unhappy that I am!

(*e*) Resting weary limbs at last on beds of *asphodel.*

(*f*) Like to some branch of stars we see
Hung in the golden *Galaxy.*

(*g*) Thro' scudding drifts the rainy *Hyades*
Vext the dim seas.

3. Make brief notes on the italicized words in question 2.

B.—SCOTT.

1. Give a brief topographical description of the Lady of the Lake country.

2. Make notes on the following: linn, Ascabart, strathspey, coronach, Leech, Tinchel, slogan, Taghairm, pibroch, erne.

3. Give a short account of the character and adventures of Douglas.

C.—SHAKSPERE.

1. Sketch the character of King Richard II.

2. By whom, and in what circumstances were the following spoken?

(*a*) The worst is Death, and Death will have his day.

(*b*) Mine honour lives when his dishonour dies.

(*c*) Be swift like lightning in the execution.

(*d*) We three here part that ne'er shall meet again.

(*e*) O heinous, strong and bold conspiracy!

3. Make notes on the following:

(*a*) One flourishing branch of his most royal root
Is crack'd, and all the precious liquor spilt.

(*b*) The bay-trees in our country are all withered.

(*c*) What doth he with a bond
That he is bound to?

(*d*) That blood already, like the pelican,
Hast thou tapp'd out and drunkenly caroused.

(*e*) Though some of you with Pilate wash your hands.

D.—STOPFORD BROOKE.

1. Write a paragraph on each of the following: King Alfred, William Langland, Geoffrey Chaucer, John Milton.

2. What can you say of the English drama before Shakspere?

3. Name, with some regard for order of production, twelve plays of Shakspere.

4. Give some account of the life and work of Edmund Spenser.

5. Name, with approximate dates, any six important poets of the nineteenth century, and one characteristic work of each.

E.—COLLIER'S ENGLISH LITERATURE.

(*Optional with Stopford Brooke.*)

1. Give some account of the most important Anglo-Saxon writings.

2. Write on the life and work of Sir Philip Sidney *or* Sir Walter Raleigh.

3. Make notes on each of the following, giving in each case the author's name, and approximate date: *Confessio Amantis, The School Master, Paradise Lost, The Tatler, Lays of Ancient Rome.*

4. Name six important writers of the nineteenth century, and one characteristic work of each.

Notice to Ontario Candidates.

Candidates from Ontario may select from F., G. & H. such sections as are required for the Junior Leaving Examination of Ontario.

F.—Scott, Lay of the Last Minstrel.

1. Write briefly on the supernatural element in the Lay of the Last Minstrel.

2. Quote any twelve consecutive lines of the poem *or* give in your own words the substance of Canto V.

3. Make explanatory notes on the following: Dunedin; aventayle; amice; litherlie; sheeling; morion; whinger; dight; so mot I thrive; Letter or line know I never a one, Were't my neck-verse at Hairibee.

G.—The Merchant of Venice.

(*Optional with King Richard II.*)

1. Quote any twelve or more consecutive lines of the play *or* give the substance of Act IV.

2. By whom and in what circumstances were the following lines spoken?

(*a*) You have a noble and a true conceit of God-like amity.

(*b*) The crow doth sing as sweetly as the lark, when neither is attended.

(*c*) I'll follow him no more with bootless prayers.

(*d*) How many then should cover that stand bare!

(*e*) God made him, and therefore let him pass for a man.

3. Make notes on the following:

Wealthy Andrew, Sibylla, Sophy, sand-blind, God's sonties, A Daniel come to judgment, Aeson, patines, cater-cousins, Pythagoras.

H.—Julius Cæsar.

1. Sketch the character of Brutus.

2. Make notes on the following:—Até, Lupercal, orts, Ides, Hybla bees, neats' leather, thunder-stone.

Sign'd in thy spoil, and crimson'd in thy Lethe.

3. Say in what connection the following extracts are found, and make notes where necessary:—

(*a*) His countenance, like richest alchemy,
Will change to virtue and to worthiness.

(*b*) That unicorns may be betrayed with trees,
And bears with glasses, elephants with holes.

(*c*) The heavens themselves blaze forth the death of princes.

(*d*) The Genius and the mortal instruments
Are then in council.

(*e*) O hateful error, melancholy's child.

COLLIER'S "GREAT EVENTS OF HISTORY."

TUESDAY, JUNE 17TH:—MORNING, 9 TO 10.30.

Answer question 8 *and any five of the other questions.*

1. Describe the persecution of the Christians under Trajan, Marcus Aurelius and Diocletian.

2. Sketch the growth of the Papacy.

3. Give some account of the Byzantine Court.

4. Outline the chief events of the last four Crusades.

5. Write what you know about the Expulsion of the Moors from Spain.

6. What are the leading events in the rise of the Dutch Republic?

7. Describe the career of Cardinal Richelieu.

8. Make brief, clear notes on the following subjects: the sakc of Madgebur, 1631; the war of the Fronde; the relief of Vienna, 1683; the treaty of Aix-la-Chapelle, 1748; the partition of Poland; the Directory; the battle of Marengo; the revolution of 1848; Schleswig-Holstein, the battle of Bull Run.

GREEK AND ROMAN HISTORY.

TUESDAY, JUNE 17TH:—MORNING, 9 TO 10.30.

A.—GREEK HISTORY.

Answer any two of the first three questions and question 4.

1. Write what you know about the following persons:
   (*a*) Periander;
   (*b*) Aristides;
   (*c*) Phormio;
   (*d*) Epaminondas.

2. (*a*) Describe the organization of Sparta.
   (*b*) Outline that art of the Peloponnesian War which follows the Athenian disasters in Sicily.

3. (*a*) Discuss the good and evil of the Tyrants.
   (*b*) Describe the constitution of Kleisthenes.
   (*c*) State the results of Alexander's conquests.

4. Make brief, clear notes on the following subjects: the Delphic Amphictyony; the Areopagus; the battle of Mantinea (418); the Sacred War; the voyage of Nearchus; the Achaean League.

B.—ROMAN HISTORY.

Answer any two of the first three questions and question 4.

1. Write what you know about the following persons:
   (*a*) Lucius Quintius Cincinnatus;
   (*b*) Marcus Manlius;
   (*c*) Marcus Livius Drusus;
   (*d*) Aulus Vitellius.

2. (*a*) Describe the Samnite Wars.
   (*b*) Outline the contest between Pompey and Caesar.

3. (*a*) Give the substance of the Licinian laws.
   (*b*) What were the plans of Tiberius Gracchus for reform?
   (*c*) How was the Roman Empire founded?

4. (*a*) Assign dates to the following events: the expulsion of the Tarquins; Hasdrubal's defeat at the Metaurus; the assassination of Julius Caesar.
   (*b*) Connect events with the following dates: B.C. 241; B.C. 102; A.D. 69.

PHYSIOGRAPHY.

THURSDAY, JUNE 12TH:—AFTERNOON, 4 TO 5.30.

1. In what direction does the earth revolve round the sun? Give the diameter of its orbit; the inclination of its axis. Explain how the latter causes the seasons, using a diagram.

2. Explain any two of these:—(1) rainbows (2), the colours at sunset; (3) the Mirage; (4) the great circular halos sometimes seen round the moon.

3. Describe and account for the Monsoons.

4. Describe the different kinds of clouds. How do you account for (*a*) Cumulus clouds (*b*) the dryness of the Arizona desert?

5. Explain how the neighbourhood of large bodies of water affects climate. Give some striking instance.

6. Describe and indicate on a rough map, the main features of the river system of North America.

7. Name and locate an instance of each of the following:—coral islands, canons, coal seams, glaciers.
Describe and explain the formation of any two.

8. How do you suppose the giraffe has come by his long neck? Give your own views in a few words, and mention one or two other instances to bear out your explanation.

PHYSICS.

FRIDAY, JUNE 13TH:—AFTERNOON, 3 TO 4.30.

1. Describe experiments to show (1) that air has weight; (2) that a solid may have pores.

2. Describe a barometer and explain how it measures the pressure of the atmosphere.

3. A box, 2 feet long and 1 foot wide, floats in water with its bottom 15 inches below the surface. What is the weight of the box? (1 cub. ft. of water weighs 1,000 oz.).

4. A stone is dropped down a well 441 feet deep. How soon will it reach the bottom? ($g=32$).

5. A force of 5 lbs weight is applied to a mass of 20 lbs. What speed will it produce in 4 seconds?

6. What is *Radiation* of Heat? Explain the formation of Dew.

7. Describe carefully how you would test the accuracy of the boiling point of a mercury thermometer.

8. What is meant by the Specific Heat of a substance? The specific heat of mercury is $\frac{1}{30}$. If 5 lbs of mercury at 100° C. are dropped into 1 lb. of water at 16° C., what will be the temperature of the mixture?

CHEMISTRY.

WEDNESDAY, JUNE 11TH:—AFTERNOON, 3 TO 4.30.

Answer two questions from each group.

I.

1. How much water is produced by the combustion of 5 grams of hydrogen? What are the properties of pure water?

2. What takes place when sulphuric acid acts upon common salt? Write the equation. What are the properties of the gas evolved?

3. Give the names and formulae of the nitrogen oxides. What law do these oxides illustrate? Describe briefly one member of the series.

II.

1. Describe any experiments illustrating (*a*) the oxidizing power of nitric acid, and (*b*) the reducing power of carbon.

2. Describe the preparation of one of the compounds of sulphur, giving a drawing of the apparatus that you would employ.

3. What weight of sulphuric acid would be required to exactly neutralize 10 grams of pure caustic potash? (K. 39; S. 32.)

III.

1. How is carbon dioxide prepared? What are its properties? Explain its relation to plants and animals.

2. How does phosphorus occur in nature? What are its properties?

3. Write equations illustrating the changes that take place in any two of the following cases:—(*a*) when hydrochloric acid acts upon iron sulphide, (*b*) when ammonium nitrate is heated, (*c*) when hydrochloric acid acts upon manganese dioxide.

BOTANY.

MONDAY, JUNE 16TH:—MORNING, 9 TO 10.30.

1. Describe the vegetative parts of a plant, their directions of growth and the general purposes which they serve.

2. Describe some of the more important provisions for the dispersion of plants through seeds and fruits, and give illustrations of two important examples.

3. What constitutes a fruit in plants? Give the essential characteristics of (1) a berry, (2) a pome and (3) a drupe. Give examples of each.

4. Describe as fully as you can the essential characteristics of (1) Gymnosperms and (2) Angiosperms. Give examples.

5. What is the special utility of colour, odour and nectar in flowers?

6. What relation does free oxygen bear to the growth of plants? Describe as fully as you can the nature and operation of the function with which it is connected.

PHYSIOLOGY AND HYGIENE.

MONDAY, JUNE 16TH:—MORNING, 10.30 TO 12.

1. Explain the significance of the following terms: æsophagus, villus, capillary, ventricle, gland, corpuscle.

2. Describe briefly how the circulation of the blood is maintained, and explain how it is controlled by the nervous system.

3. What changes take place in the blood and air through respiration. Discuss the relation of dress, ventilation, and exercise to this important function.

4. Name the principle varieties of food-stuffs. What do you know of the value of each to the body? State whether you include alcohol among the foods and give your reasons.

5. Name the principal divisions of the brain and assign the proper functions to each.

GEOMETRICAL AND FREEHAND DRAWING.

MONDAY, JUNE 16TH:—AFTERNOON, 2 TO 5.

PART I.

1. Construct a square having the same area as a pentagon of one inch length of side.

2. Two lines meet at an angle of 30^0. Find the circle to which both lines are tangent and which has a diameter of 3 inches.

3. A circle of 2 in. diameter rolls on a straight line. Find one loop of the curve described by a point 1-2 in. without the circle, and moving with it.

4. Draw the portion of a parabola on a double ordinate of 4 inches and having a height of 1.5 in.

PART II.

5. Make a copy of the drawing before you, enlarged to about twice its size.

6. Make a drawing representing a cylinder having a length about twice its diameter and placed to the left of and below the level of the eye; the axis horizontal, and making an angle of approximately 45^0 with the line of sight.

7. Make an outline drawing of the base of a column before you as it appears from your point of view. (A drawing in light and shade may be substituted for the outline drawing).

PART III. (*Optional with Part I.*)

8. Make a pencil drawing of the moulding before you.

9. Make a drawing in water colour of the group of objects.

NOTE.—Marks will not be given in the problems of Part II., if instruments are used in the drawing.

The object in question 7 is to be placed at a distance of four feet from the eye resting upon a surface 1.5 ft. below the eye. The vertical face of the plinth, which is to the right of the candidate, is to make an angle of 60^0 with the line joining the eye to the centre of the object.

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